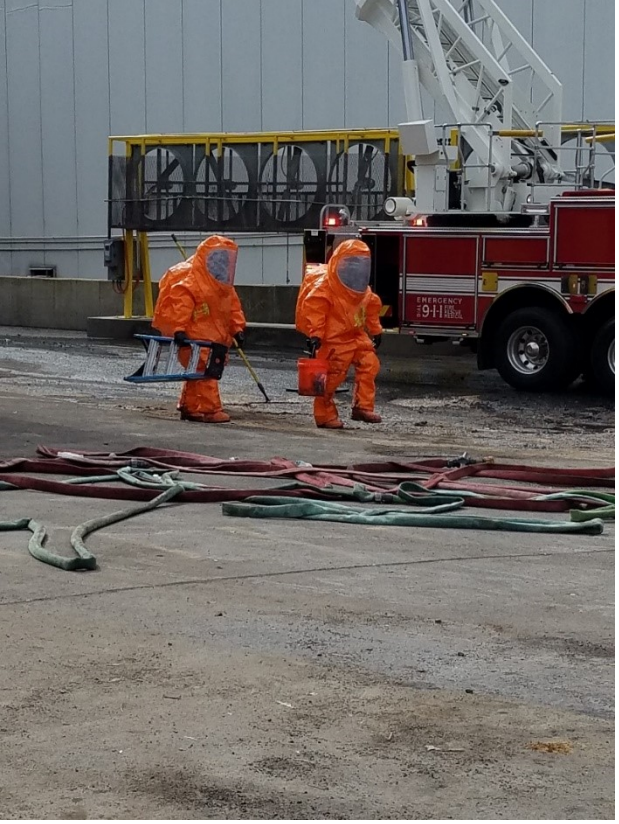
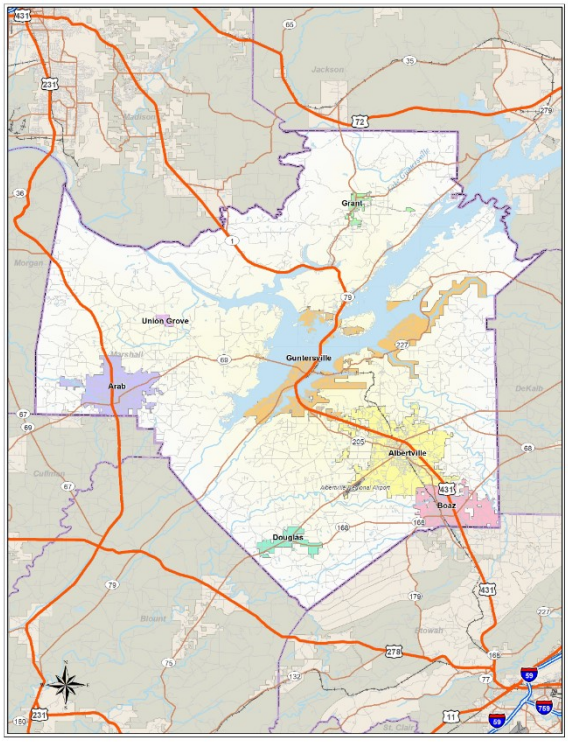


2020 Marshall County Multi-Hazard Mitigation Plan









Albertville, Arab, Boaz, Douglas, Grant, Guntersville, Union Grove and Unincorporated Marshall County

Prepared by the Marshall County EMA
and Hazard Mitigation Planning Committee
FEMA Approved: August 27, 2021

2020 Marshall County Multi-Hazard Mitigation Plan

City of Albertville, City of Arab, City of Boaz, Town of Douglas, Town of Grant, City of Guntersville, Town of Union Grove, and Marshall County, Alabama

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Executive Summary

I. Introduction

The 2020 Marshall County Multi-Hazard Mitigation Plan is the third update of the 2004 Marshall County Natural Hazard Mitigation Plan. This plan has served and continues to serve as a guide for all communities and agencies that have participated in the preparation of this plan through the Hazard Mitigation Planning Committee (HMPC). The HMPC for this update was comprised of representatives of the unincorporated areas of Marshall County, representatives from the cities of Albertville, Arab, Boaz, and Guntersville and the towns of Grant, Douglas, and Union Grove. Also serving on the HMPC were representatives from the boards of education for Marshall County, Albertville, Arab, Boaz, and Guntersville. This plan update fulfills the requirements of the Federal Disaster Mitigation Act of 2000 (DMA 2000) as administered by the Alabama Emergency Management Agency (AEMA) and the Federal Emergency Management Agency (FEMA) Region IV.

FEMA oversees the hazard mitigation process for the Federal Government. It reviews all hazard mitigation plans for compliance with the federal requirements and provides feedback to the states and local governments. Through guides that have been produced by FEMA, those charged with complying with the federal regulations are equipped to fulfill the requirements set forth by the Federal Government. FEMA states that "Developing hazard mitigation plans help state, tribal and local governments to:

- Increase education and awareness on natural hazards and community vulnerabilities;
- Build partnerships with government, organizations, businesses, and the public to reduce risk;
- Identify long-term strategies for risk reduction with input from stakeholders and the public;
- Identify cost-effective mitigation actions that focus resources on the greatest risks areas;
- Integrate planning efforts and risk reduction with other community planning efforts;
- Align risk reduction with other state, tribal or community objectives; (and)
- Communicate priorities to potential funders."

This plan update sets out to achieve the objectives stated above.

II. Authority

In 2000 the Federal Government passed Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U. S.C. 5165 as amended by the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390), to encourage states, tribes, and local governments to undertake a risk-based approach to reducing risks to natural hazards through mitigation planning. Regulations were passed through 44 CFR Part 201 to assist in meeting the goals of the Stafford Act. These Federal regulations describe the requirement for a State Mitigation Plan as a condition of pre- and post-

disaster assistance as well as the mitigation plan requirement for local and Tribal governments as a condition of receiving hazard mitigation assistance. 44 CFR 201.6(d)(3) requires that a local jurisdiction must review and revise its local plan to reflect any changes and resubmit it for approval within five years in order to remain eligible for mitigation grant funding.

III. Organization of the Plan

The 2020 Marshall County Multi-Hazard Mitigation Plan is organized similarly to the previous versions of the Marshall County hazard mitigation plan and parallels the 44 CFR Section 201.6 Federal requirements for a local mitigation plan, as interpreted by Local Mitigation Planning Handbook, FEMA, March 2013. Each chapter of the 2020 plan update references the requirements of 44 CFR Section 201.6 that it addresses and includes a summary the updates to the 2014 plan.

The plan is comprised of three volumes:

Volume I	*Comprehensive Plan*
	Executive Summary
Chapter 1	Introduction
Chapter 2	Prerequisites
Chapter 3	Community Profiles
Chapter 4	The Planning Process
Chapter 5	Risk Assessment
Chapter 6	Mitigation Strategy
Chapter 7	Plan Maintenance Process

Volume II	*Appendices*
A	Federal Requirements for Local Mitigation Plans
B	Community Mitigation Capabilities
C	2014 Plan Implementation Status
D	Hazard Ratings and Descriptions
E	Hazard Profile Data
F	Identification and Analysis of Mitigation Measures
G	Committee Meeting Documentation
H	Community Involvement Documentation
I	Multi-Jurisdictional Participation Activities
J	Adopting Resolution

Volume III *Community Action Programs*

III. Highlights of the Plan

This update to the 2014 Marshall County Multi-Hazard Mitigation Plan revaluates the risks that hazards pose to the jurisdictions of Marshall County. Through discussions and written exercises, the HMPC assisted in compiling the information presented in this plan. The strategies presented serve as possible solutions for local governments to employ in their ongoing efforts to reduce community vulnerabilities. The plan also presents findings of the evaluation of the 2014 mitigation strategy that shows the mitigation measures that worked, and those that did not. A number of strategies from the previous plan have been deleted because they were not feasible and new measures have been added based off the findings of this planning process.

This plan includes detailed descriptions of the hazards that affect Marshall County; each jurisdiction's vulnerability to the hazards; mitigation strategies that can be used to reduce or eliminate the risks posed by the hazards; the mitigation measures each jurisdiction chose to implement over the next 5 years; and how the HMPC plans to continue evaluate the progress of the plan over that same time period. This update added the hazard category pandemics and infectious diseases.

Volume I - Comprehensive Plan

Chapter 1. Introduction

Chapter 1 introduces the development of the plan update and lists the jurisdictions that participated in the planning process. It provides information about funding possibilities for the mitigation strategies presented in the plan and the eligibility requirements to qualify for FEMA hazard mitigation assistance grants. Summaries of previous editions of the Marshall County plans are included along with information about the organization of the 2020 plan.

Chapter 2. Prerequisites

Chapter 2 details the requirement of plan approval for eligibility of certain grants mentioned in Chapter 1. It lays out the steps that must be taken to qualify for FEMA funds and how the HMPC set out to meet those qualifications throughout the plan update process.

Chapter 3. Community Profiles

Chapter 3 provides information about the participating jurisdictions, painting a picture of each community so the reader can get a better understanding of the area that is impacted by the different hazards and the limitations faced by the communities. Included in this chapter for each community are: geographic setting and history, government, physical features, climate, demographics, economy, utilities, media, and transportation. All of these play an important role in fulfilling the mitigation strategies chosen by the jurisdictions.

Chapter 4. The Planning Process

Chapter 4 details the planning process for this update including the makeup of the Hazard Mitigation Planning Committee. Due to the COVID-19 outbreak during the planning process, the

planning timetable was extended to ensure the process could continue safely. Tentatively planned public participation events were suspended although in-person participation in the HMPC meetings held at the EMA was not discouraged. The public was still afforded opportunities through the plan website and their jurisdictional meetings to participate in the planning process.

The chapter describes opportunities for involvement in the planning process, how the plan was prepared and how the plan could be incorporated into other plans and documents. It also covers the plan review and update process.

Chapter 5. Risk Assessment

Chapter 5 covers the hazards that impact the communities and the vulnerability of the communities to the hazards listed. The chapter begins with risk assessments of the different hazards. This assessment includes a description of the hazards that occur or might occur within Marshall County. Included in the description are the location, extent and intensity of the hazard; previous hazard events; and the probability of future events. A listing of the hazards and the impacts they have on the jurisdictions is included to demonstrate jurisdictional differences.

The chapter then addresses the vulnerabilities of structures within the jurisdictions to the hazards from the risk assessment. The HMPC utilized Hazus-MH and other sources to analyze the economic impacts of the hazards on the communities using flooding, earthquakes, and hurricane scenarios.

Chapter 6. Mitigation Strategy

Chapter 6 presents the mitigation strategies chosen by the HMPC and their evaluation process. It covers the goals and objectives set forth in previous plans and carried forward to this update. Those goals and objectives are aligned with FEMA's program categories as follows:

- Prevention. Adopting and administering ordinances, regulations, and programs that manage the development of land and buildings to minimize risks of loss due to hazards.
- Property Protection. Protecting structures as well as their occupants and contents from the damaging effects of natural, human-caused, and technological hazard occurrences, including retrofitting existing structures to increase their resistance to damage and to reduce exposure of occupants to harm; relocating vulnerable structures and occupants from hazard locations; and conversion of developed land to permanent open space through acquisition and demolition of existing structures.
- Education and Outreach. Educating and informing staff and the public about the risks of hazards and the techniques available to reduce threats to life and property.
- Natural Resources Protection. Preserving and restoring the beneficial functions of the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.

- Structural Projects. Engineering structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of a hazard on a community.

The chapter also presents the process for choosing the mitigation measures each jurisdiction would implement over the next five years. It discusses the jurisdictions' capabilities and the status of implementation of the 2014 mitigation strategy for each community. Through the evaluation of capabilities and the success or failure of the past mitigation strategies, the communities chose measures for this update. Chapter Six provides information on the prioritization of measures through the use of the STAPLEE evaluation method and includes a multi-jurisdictional table of all mitigation measures assigned to the different jurisdictions. The jurisdictions chose mitigation measures that were realistic in reaching each communities' goals.

Chapter 7. Plan Maintenance Process

Chapter 7 covers the process for maintaining the hazard mitigation plan. Once the plan has been adopted, it must be maintained until the next update. This section delineates the steps to be taken to monitor, evaluate and update the plan. Also included in the chapter are methods to incorporate the mitigation plan update into other planning mechanisms and steps to include participation of the public in the plan maintenance process. Forms for evaluating the plan and mitigation measures throughout the five-year time period have been included.

Volume II – Appendices

Volume III contains the Appendices. The appendices are most of the supporting documents for the plan update. Supporting documents that were not included in Volume III are available for review at the offices of the Marshall County EMA.

Appendix A - **Federal Requirements for Local Mitigation Plans** - 44 CFR Sec. 201.6 requirements for local mitigation plans.

Appendix B - Community Mitigation Capabilities - the results of the capabilities assessment for each jurisdiction conducted during the plan update.

Appendix C - 2014 Plan Implementation Status – the results of the evaluation of the implementation status of the mitigation measures for each jurisdiction from the 2014 plan update

Appendix D - Hazard Ratings and Descriptions – the results of the hazard ratings exercise by the HMPC for identifying hazards for inclusion in the 2020 plan update. Descriptions of the hazards in the plan update are included in this appendix.

Appendix E - Hazard Profile Data - records of hazard events that impacted Marshall County from the National Weather Service, the National Climatic Data Center, and area newspapers.

Appendix F - Alternative Mitigation Measures - lists of mitigation measures considered during the mitigation strategy selection process.

Appendix G - Committee Meeting Documentation – documentation of the HMPC meetings during the planning process.

Appendix H - Community Involvement Documentation – documentation of the efforts to include the community in the planning process.

Appendix I - Multi-Jurisdictional Participation Activities - records of jurisdictional participation in the planning process and adoption of the plan.

Appendix J - Adopting Resolution – copy of a model resolution for plan adoption by the governing bodies of the jurisdictions.

Volume III – Community Action Programs

Volume III contains individual tables for each jurisdiction which assigns priority to selected mitigation measures, establishes a general completion schedule, assigns responsibility for carrying out the measures, estimates costs if available, and identifies potential funding sources, including potential eligibility for FEMA Hazard Mitigation Assistance Programs. The HMPC chose measures that are within the legal authority of the jurisdiction and those they believe will be achievable administratively, politically, technically, economically, and environmentally over the next five years.

Other Documents

Other documents and materials kept on file in the Marshall County EMA office include but are not limited to:

- Local newspaper articles reporting hazard events since 1960;
- 2020 Hazus-MH global reports for earthquakes, hurricanes, and floods;
- Damage reports of hazard events;
- Meeting records of the Hazard Mitigation Planning Committee since it was first established in 2004; and
- Documentation in support of the original 2004 plan and its 2009, 2014 and 2020 updates.

Chapter 1 – Introduction

1.1 Plan Development
1.2 Authority
1.3 Funding
1.4 Eligibility for FEMA Hazard Mitigation Assistance Grants
1.5 Previous Editions of the Marshall County Hazard Mitigation Plans
1.6 The 2020 Marshall County Multi-Hazard Mitigation Plan Update

1.1 Plan Development

The 2020 Marshall County Multi-Hazard Mitigation Plan is the third update of the 2004 Marshall County Natural Hazard Mitigation Plan. This plan has served as a guide for all communities and agencies that have participated in the preparation of this plan through the Hazard Mitigation Planning Committee (HMPC). The HMPC for this update was comprised of representatives for the unincorporated areas of Marshall County, the cities of Albertville, Arab, Boaz, and Guntersville and the towns of Grant, Douglas, and Union Grove. Also represented on the HMPC were members of the boards of education for Marshall County, Albertville, Arab, Boaz, and Guntersville. The plan update fulfills the requirements of the Federal Disaster Mitigation Act of 2000 (DMA 2000) as administered by the Alabama Emergency Management Agency (AEMA) and the Federal Emergency Management Agency (FEMA) Region IV.

1.2 Authority

Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U. S.C. 5165 as amended by the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390), provides for states, Tribes, and local governments to undertake a risk-based approach to reducing risks to natural hazards through mitigation planning. The National Flood Insurance Act of 1968, as amended, 42 U. S. C. 4001 *et seq*. reinforced the need and requirement for mitigation plans, linking flood mitigation assistance to state, tribal and local mitigation plans.

Through regulations in 44 CFR Part 201, FEMA has implemented the various hazard mitigation planning provisions which also permit human-caused hazards to be addressed in a local mitigation plan. These Federal regulations describe the requirement for a state mitigation plan as a condition of pre- and post-disaster assistance as well as the mitigation plan requirement for local and tribal governments as a condition of receiving hazard mitigation assistance. 44 CFR 201.6(d)(3) requires that a local jurisdiction review and revise its local plan to reflect any changes and resubmit it for approval within five years of FEMA approval in order to remain eligible for mitigation grant funding.

1.3 Funding

The Marshall County EMA applied to the Alabama EMA for planning-grant funds in 2018 to complete the 5-year update of the 2014 Marshall County Multi-Hazard Mitigation Plan. In October 2019, the Alabama EMA awarded a $20,000.00 planning grant funded through the FEMA Hazard Mitigation Grant Program (HMGP) to the Marshall County Commission to fund 75% of the total cost of the five-year plan update for all incorporated and unincorporated areas within Marshall County. The Marshall County Commission furnished the remaining 25% of the total cost through in-kind services for a total planning cost of $26,667.00.

1.4 Eligibility for FEMA Hazard Mitigation Assistance Grants

Adoption of this plan is the initial step towards continuing eligibility for FEMA Hazard Mitigation Assistance (HMA) grant assistance to participating localities. FEMA programs that require a current hazard mitigation plan for local jurisdictions include the Hazard Mitigation Grant Program, the Building Resilient Infrastructure and Communities Program (formerly PDM) and the Flood Mitigation Assistance Program. A brief outline of each of these programs is included below.

The Hazard Mitigation Grant Program (HMGP) is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (the Stafford Act), Title 42, U.S. Code (U.S.C.) 5170c. It provides opportunities for communities to undertake mitigation measures to reduce the risk of loss of life and property from future disasters during the reconstruction process following a disaster. Following a Presidential major disaster declaration, funding becomes available in the areas of the state requested by the Governor. The amount of HMGP funding offered is based upon the estimated total of Federal assistance for disaster recovery under the declaration: up to 15 percent of the first $2 billion of the total estimated disaster assistance, up to 10 percent for amounts between $2 billion and $10 billion, and up to 7.5 percent for amounts between $10 billion and $35.333 billion. For states with enhanced hazard mitigation plans, up to 20 percent for estimated amounts of disaster assistance not to exceed $35.333 billion can become available.

In 2020, the Building Resilient Infrastructure and Communities (BRIC) Program replaced the Pre-Disaster Mitigation Grant Program (PDM). BRIC continues to provide funds to states, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. The emphasis of the BRIC program is to work “toward research-supported, proactive investment in community resilience.” FEMA anticipates BRIC funds will be available for plans and projects that demonstrate innovative approaches to partnerships, such as shared funding mechanisms, and/or project design that reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. BRIC grants are awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds. For FY 2018, $250 million in Pre-Disaster Mitigation funding was available nationwide.

The Flood Mitigation Assistance Program (FMA) was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). FEMA provides FMA funds to assist states and communities with the implementation of measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program. For FY 2018, $160 million in FMA funding was available nationwide. Seventy million dollars of the $160 million was set aside for community flood mitigation proposals. Two types of FMA grants are available to communities:

- *Planning Grants* to prepare Comprehensive Flood Mitigation Plans
- *Project Grants* to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. Priority is given to properties that have incurred repetitive flood insurance losses.

In addition to the above-mentioned grant programs, there are two programs that require a current hazard mitigation plan at the state level but not at the local level for FEMA funds to be available to the state. Those are the Public Assistance (PA) Grant Program – Categories C-G and the Fire Management Assistance Grant Program.

The Public Assistance (PA) Grant Program (Categories C-G) provides assistance to state, tribal and local governments, and certain types of Private Nonprofit organizations to quickly respond to and recover from major disasters or emergencies declared by the President. Through categories C – G of the PA Program, FEMA provides supplemental Federal disaster grant assistance for the repair, replacement, or restoration of public infrastructure and facilities and the facilities of certain Private Non-Profit (PNP) organizations that were damaged by the declared disaster. The PA Program can also be used to protect these damaged facilities from future events through hazard mitigation measures.

The Fire Management Assistance Grant Program (FMAG) provides grants to states, local and tribal governments. Funds can be used for the "mitigation, management, and control of fires on publicly or privately owned forests or grasslands," where destruction poses such a threat that could result in a major disaster declaration. The state submits a request for assistance to FEMA at the time a "threat of major disaster" exists. The process is expedited with a FEMA decision made within hours. The FMAG provides a 75 percent Federal cost share with the state for eligible firefighting costs, such as "expenses for field camps; equipment use, repair and replacement; tools, materials and supplies; and mobilization and demobilization activities."

1.5 Previous Editions of the Marshall County Hazard Mitigation Plan

The first hazard mitigation plan for Marshall County was written and adopted in 2004. The plan addressed all natural hazards deemed to threaten property and people within the county. Both short- and long-term hazard mitigation strategies were addressed, implementation tasks assigned, and funding alternatives identified. The planning process began in January 2004 with the convening of the

Hazard Mitigation Planning Committee (HMPC) and in July 2004 the plan was approved and adopted by the county and all participating municipalities.

In accordance with the federal regulations, every five years the Marshall County HMPC has reconvened to update the previous plan. During the update process in 2009, the HMPC agreed to incorporate human-caused hazards into the plan and the plan's title was changed to the Marshall County Multi-Hazard Mitigation Plan to indicate the inclusion of all known hazards that impact Marshall County. The plan was updated in 2009 and again in 2014. All jurisdictions within Marshall County and the unincorporated areas of the county have participated in the plan updates over the years. Many stakeholders including the boards of education and the forestry commission have offered their input into the plan and its updates.

1.6 The 2020 Marshall County Multi-Hazard Mitigation Plan Update

In October 2019, the AEMA awarded Marshall County a PDM grant to assist in financing the update to the hazard mitigation plan as the 2020 Marshall County Multi-Hazard Mitigation Plan. Under the direction of the Marshall County EMA Director, Anita McBurnett, the HMPC reconvened to prepare the update to the plan. Representatives of the unincorporated areas of Marshall County; the cities of Albertville, Arab, Boaz, and Guntersville; and the towns of Grant, Douglas and Union Grove; all local school boards; as well as other stakeholders and interested agencies, including the Marshall County Department of Public Health, and the Marshall Medical Centers EMS served on the committee.

During the planning process, the country was affected by the COVID-19 Pandemic and scheduled meetings were postponed. Once meetings were restarted, two were held in-person and virtually in order to provide an opportunity for all who were interested to attend. In all, ten meetings were held by the HMPC to discuss the hazards, both natural and human-made, that effect the Marshall County area and possible mitigation measures to lessen the impact of the hazards. The HMPC oversaw the drafting of the plan update and aided in the dissemination of information to members of the public. The 2020 planning process continued the collaborative effort among all Marshall County communities and continues to guide Marshall County communities in their ongoing efforts to mitigate hazard related vulnerabilities.

Chapter 2 – Prerequisites

2.1 Federal Prerequisites
2.2 Plan Approval Required for Mitigation Grants Eligibility
2.3 Multi-Jurisdictional Participation
2.4 Multi-Jurisdictional Plan Adoption

2.1 Federal Prerequisites

This chapter addresses the Prerequisites of 44 CFR Sections 201.6(a)(1) and (4) and (c)(5), as follows:

> "Section 201.6(a) *Plan requirements.*
> (1) A local government must have a mitigation plan approved pursuant to this section in order to receive HMGP project grants. ... A local government must have a mitigation plan approved pursuant to this section in order to apply for and receive mitigation project grants under all other mitigation grant programs.
> (4) Multi-jurisdictional plans (*e.g.* watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan
>
> Section 201.6(c) *Plan content.*
> The plan shall include the following:
> (5) *Documentation* that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted."

2.2 Plan Approval Required for Mitigation Grants Eligibility

FEMA approval of this plan is the first step in assuring continued eligibility for FEMA grant assistance to participating localities and school districts, under the following hazard mitigation assistance programs: the Hazard Mitigation Grant Program (HMGP), the Building Resilient Infrastructure and Communities Grant Program (BRIC) – Formerly the Pre-Disaster Mitigation Grant Program (PDM), the Flood Mitigation Assistance Program (FMA), Categories C – G of the Public Assistance (PA) Grant Program, and the Fire Management Assistance Grant Program (FMAG). Following plan approval, pending adoption, the plan must be formally adopted by the governing bodies of the participating jurisdictions and school districts, and they must submit their adopting resolutions to FEMA through the Alabama EMA in order to receive official FEMA approval. Participants are allowed twelve months from the time of FEMA's notification of conditional approval pending adoption to adopt the plan. If the plan is not approved by FEMA and/or locally adopted by resolution of the governing body, the jurisdiction or school board will forfeit eligibility to apply for and receive project grants under any of the FEMA hazard mitigation assistance programs until they have a FEMA approved plan. Hazard

mitigation assistance programs have additional requirements for grant eligibility depending on the program's funding source.

2.3 Multi-Jurisdictional Participation

The Marshall County EMA serves as the lead coordinating agency for mitigation planning in Marshall County. It has been working in conjunction with the Local Emergency Planning Committee (LEPC) and has coordinated mitigation activities through continued contact and cooperation with all Marshall County jurisdictions throughout the five-year period since the 2014 update was first approved. Many of the LEPC members serve on the Hazard Mitigation Planning Committee which oversees the plan update. Marshall County, the cities of Albertville, Arab, Boaz, and Guntersville, and the towns of Grant, Douglas and Union Grove have all continued to participate in the 2020 plan update of the existing plan written in 2014 either through direct or indirect representation. The towns of Douglas and Union Grove had limited participation, relying on the EMA to represent them during the mitigation meetings. In addition to the participating jurisdictions, other stakeholders affected by the plan, including Federal, State, and regional agencies, business interests, academia, non-profits, and the general public contributed to the drafting of this Plan. (See Chapter 4 – "The Planning Process" for a more detailed explanation of the organization of the HMPC and the participation of stakeholders in the planning process.)

According to Federal regulations 44 CFR Section 201.2, school districts are defined as local governments and are therefore required to have a FEMA-approved local mitigation plan to be eligible for project grants under FEMA hazard mitigation assistance programs. School districts may demonstrate their participation as a separate government entity in another local government's approved mitigation plan to be eligible for project grants under FEMA hazard mitigation assistance programs. The Marshall County, Albertville, Arab, Boaz, and Guntersville Boards of Education actively participated in and adopted the 2020 Marshall County Multi-Hazard Mitigation Plan.

The plan update process presented many opportunities for multi-jurisdictional participation. Appendix I "Multi-Jurisdictional Participation Activities," lists the types of participation afforded the participants and their level of involvement. The following include some multi-jurisdictional participation opportunities provided to the jurisdictions:

- Nine HMPC committee meetings were held between October 2019 and September 2020 during the drafting phase of the 2020 plan update, in which attendance and participation were encouraged. (See Appendix G "Committee Meeting Documentation," which includes agendas and sign-in sheets).
- HMPC exercises and questionnaires regarding local capabilities for conducting mitigation activities, the implementation status of the 2014 community mitigation action programs, identifying and rating hazards, profiling hazards and hazard events, and evaluating alternative mitigation measures, were completed by the committee members and others during or outside of HMPC meetings.

- Opportunities to review and comment on draft plan sections were provided.
- Collaboration with other committee members during the drafting phase of the plan update.
- Communication with elected officials and other jurisdictional constituents on the scope and contents of the draft plan update.
- Presentations at public hearings, to allow the public to offer commentary and input prior to the formal adoption by the governing bodies.

Residents of each jurisdiction and other stakeholders were provided the following opportunities for participation in the planning process:

- Attendance of HMPC meetings of these open public forums.
- Completion of public questionnaires.
- Access to the plan update website at hazardmitigationplans.com to keep abreast of HMPC activities, review draft sections of the plan, and offer comments and suggestions through the website's email account.
- Contact with HMPC members and Marshall County EMA staff.
- Contact with elected officials of each jurisdiction.
- Attendance at public hearings of the local governing bodies and the ability to offer comments.

2.4 Multi-Jurisdictional Plan Adoption

Following public notice and hearing, the 2020 Marshall County Multi-Hazard Mitigation Plan was adopted by the governing bodies of each participating jurisdiction, as well as the relevant school boards of Marshall County, City of Albertville, City of Arab, City of Boaz, and City of Guntersville School Districts. The jurisdictional governing bodies adopted the plan following notification by the Alabama EMA that the plan had received conditional approval from FEMA pending adoption. Adoption by all participating jurisdictions took place within one year of the notification of FEMA conditional approval, and afterwards, a certified copy of each adopting resolution was transmitted to FEMA through the Alabama EMA. The plan was formally approved by FEMA on the date that they received the first resolutions. The date of approval begins the next five-year planning cycle. FEMA then issued a final approval notification. An example of an adopting resolution can be found in Appendix J "Adopting Resolution". Copies of the adopted resolution are on file at the EMA and with each jurisdiction.

Chapter 3 – Community Profiles

3.1 Federal Advisory Guidance for Community Profiles
3.2 Summary of Plan Updates
3.3 Geographic Setting and History
3.4 Government
3.5 Physical Features
3.6 Climate
3.7 Demographics
3.8 Economy
3.9 Utilities
3.10 Media
3.11 Transportation

3.1 Federal Advisory Guidance for Community Profiles

Guidance from FEMA's Local Multi-Hazard Mitigation Planning Guidance, July 1, 2008 advisory on page 27, suggests that community profile information be included in a mitigation plan for context:

> *The planning team should consider including a current description of the jurisdiction in this section or in the introduction of the plan. The general description can include a socio-economic, historic, and geographic profile to provide a context for understanding the mitigation actions that will be implemented to reduce the jurisdiction's vulnerability.*

FEMA published an update to the above-referenced 2008 advisory guidance, Local Mitigation Planning Handbook, March 2013. This latest guidance advises that community assets be identified in step 2 of Task 5 *Conduct a Risk Assessment.* This step requires identification of "People, Economy, Built Environment, and Natural Environment," all of which are profiled herein and incorporated into the vulnerability components found in sections 5.4 through 5.9 of Chapter 5 "Risk Assessment" in this plan update.

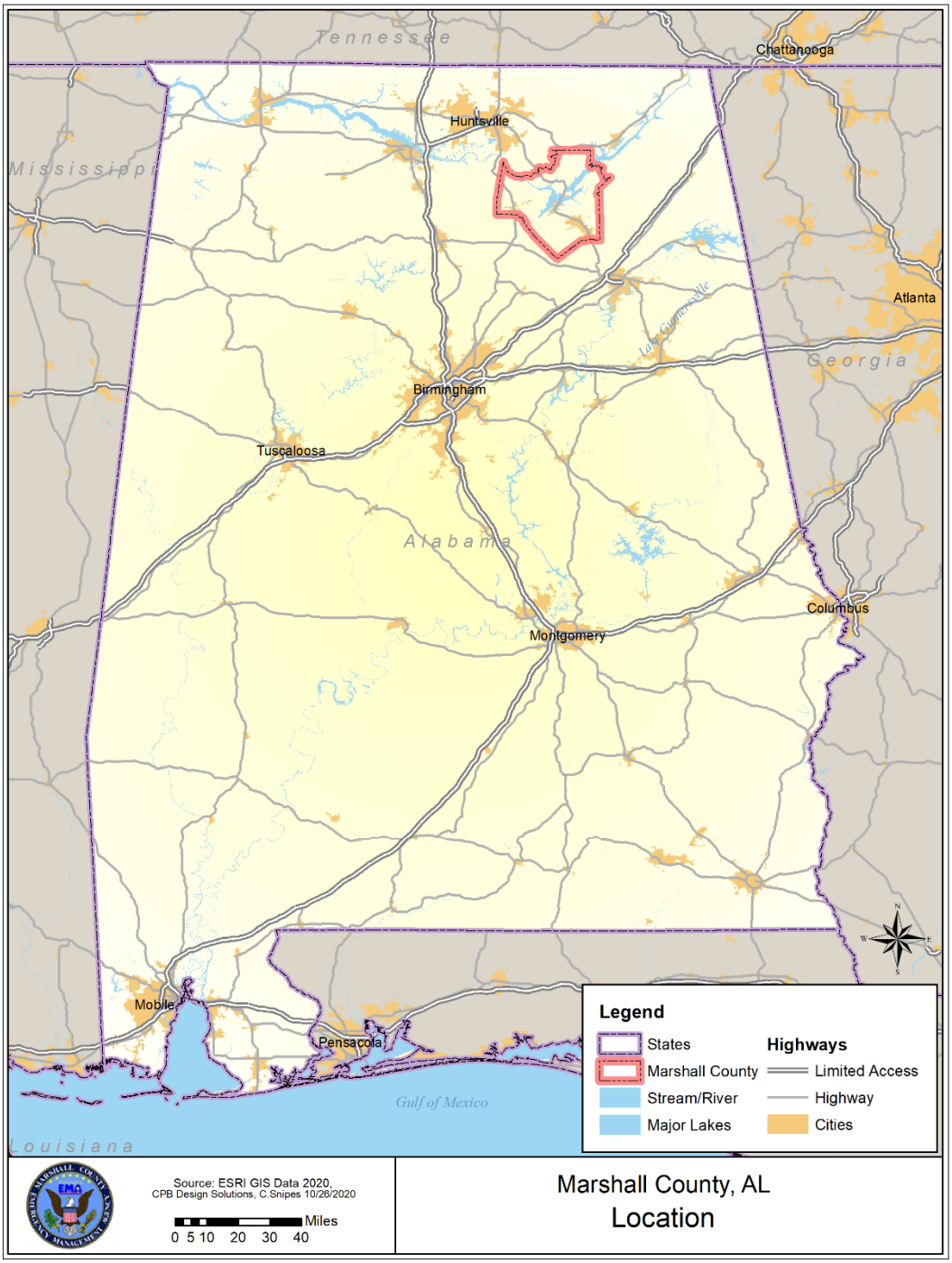
3.2 Summary of Plan Updates

All sections of the Community Profiles chapter have been edited to include updated descriptions, maps, and data.

3.3 Geographic Setting and History

Marshall County is located in rural northeast Alabama as shown on Map 3-1. It is bordered on the northeast by Jackson County, the east by DeKalb County, the southeast by Etowah County, the southwest by Blount and Cullman Counties, on the west by Morgan County, and on the northwest by Madison County.

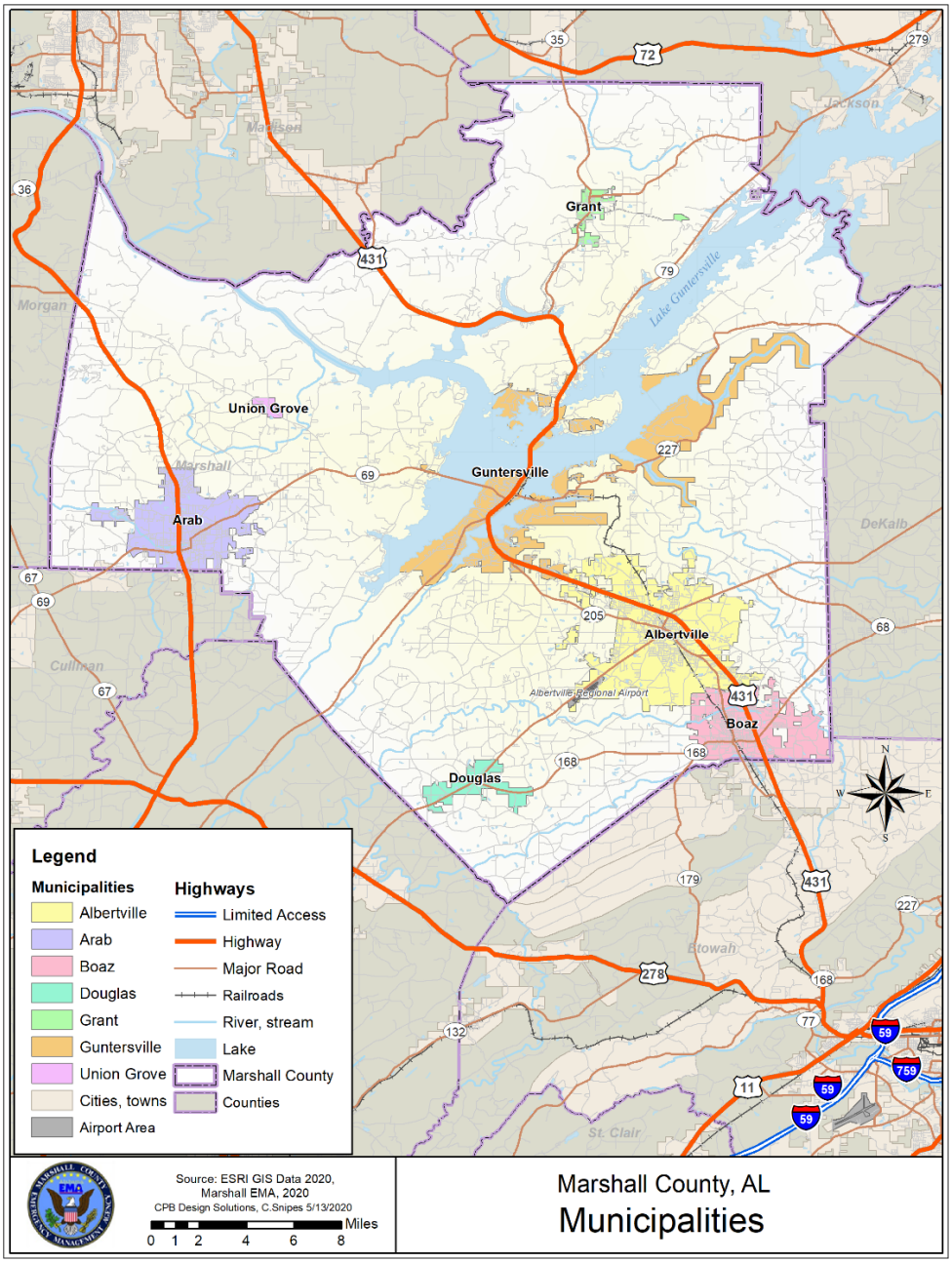
Map 3-1. Marshall County Location



On January 9, 1836, the state legislature of Alabama created Marshall County which was named for Chief Justice John Marshall. There have been four county seats - Claysville (1836), Marshall (1838), Warrenton (1841) and the current seat, Guntersville (1848).

Marshall County is comprised of seven incorporated jurisdictions and many unincorporated communities. The incorporated jurisdictions are the cities of Albertville, Arab, Boaz, and Guntersville and the towns of Douglas, Grant and Union Grove. Much of the information in the descriptions of the jurisdictions that follow are from the website Encyclopedia of Alabama.

Map 3-2. Marshall County Municipalities



City of Albertville

The City of Albertville is located in southeastern Marshall County and is the largest city on Sand Mountain. The city has a landmass of 26 square miles and 0.1 square mile of water and is located at

an elevation of 1,089 feet. The City of Albertville was named for one of its founders, Thomas Albert. The city began around 1881 when L.S. Emmett moved from Georgia and set up the city's first large store. Albertville was incorporated on February 18, 1881 with W.M. Coleman as its first mayor. One of the worst tornadoes to ever touch down in Alabama almost completely destroyed Albertville on April 24, 1908. The city recovered, and today it is the largest city in Marshall County.

In 1919, due to flooding in Guntersville from the Tennessee River, a courthouse was built in Albertville to allow for cases to be heard in the event of a flood causing inaccessibility to the courthouse in Guntersville. Albertville is considered the "fire hydrant capital of the world" because it is the home of Mueller Company's fire hydrant manufacturing operations and has been since 1975. Currently, the City of Albertville is constructing a state-of-the-art sports and recreation facility that will have tennis courts, turf fields for multiple sports, playgrounds, dog parks, a water park, an amphitheater, an indoor pool, fitness facility, basketball courts and rooms for rent. The facility is scheduled to open November 17, 2020.

City of Arab

The City of Arab is located in western Marshall County and eastern Cullman County. The city is 12.9 square miles with only 0.1 square mile of water. Arab has an elevation of 1,087 feet and is situated atop Brindlee Mountain. The founder of Arab, Stephen Tuttle Thompson, was appointed postmaster. One of his first duties was to apply to Washington, D.C. for the incorporation of Thompson's Falls. Three names were chosen for consideration for the city: Ink, Bird, and Arad**.** Arad was chosen in honor of Thompson's son, but it was accidentally written Arab. The error was never corrected. Arab was incorporated in 1892. Arab boasts the Arab Historic Village where 10 historic buildings dated from the 1800s to the 1940s are maintained by the Arab Historical Society. The village is open to visitors and showcases reenactors on the last Saturday of April who show what life was like in the past as well as hosting other special events throughout the year. The City of Arab has two city parks that include multiple athletic fields, `and the city hosts an annual horse show each July in Arab City Park.

City of Boaz

The City of Boaz is located in southeastern Marshall County. The city is 12.3 square miles, of which 12.2 square miles is land and 0.1 square miles is water. Boaz is situated on top of the Sand Mountain plateau at an elevation of 1,089 feet. The area was settled in 1878 by several families from Georgia and in 1886 was named Boaz after the husband of Ruth from the Bible. The city was incorporated in 1897. Because of the city's reliance on cotton in its early years, the boll weevil infestation in 1915 and the Great Depression devastated the economy of Boaz. In response, farmers diversified into poultry and livestock which helped the economy recover. The city is home to Snead State Community College which started as a seminary school in 1898. Citizens of Boaz, as well as visitors, can enjoy the annual Harvest Festival at the beginning of October where hundreds of arts and crafts vendors display and sell unique items. The festival also includes a pageant, entertainment, and children's activities.

Town of Douglas

The Town of Douglas is located in southern Marshall County. The Town has a total area of 3.4 square miles. Similar to most jurisdiction in Marshall County, there is less than 0.1 square mile of water in Douglas. The landmass is 3.3 square miles. Douglas was settled in the mid-19th century as a farming community and has primarily remained as such. The town was incorporated in 1978. Many of the residents of Douglas who are not employed in farming, work primarily in manufacturing or healthcare in the surrounding communities and the Huntsville metro area.

Town of Grant

The Town of Grant is located in northeast Marshall County. The town is 1.8 square miles and is comprised solely of land. Grant is situated on top of Gunter Mountain at an elevation of 1,310 feet overlooking Guntersville Lake, the Tennessee River and historic Kennamer Cove. The area was taken over by settlers in the 1830's after the Cherokee Indians who previously resided there were forcibly removed by the US government. The Town of Grant takes its name from the U.S. Post Office that was established on May 18, 1887 to serve the citizens of Gunter Mountain. The post office was named for President Ulysses S. Grant as a result of many residents supporting the Union in the Civil War. The Town of Grant was incorporated in 1945 in order to receive funding for a municipal water system. Grant is home to the Kate Duncan Smith DAR School, the only school still owned and operated by the Daughters of the American Revolution who built the school in 1924 in an effort to provide schools in underserved areas of the southeast.

City of Guntersville

The City of Guntersville is located in central Marshall County and is the county seat. The area of the city is 42.4 square miles, of which 25.4 square miles is land and 17.0 square miles is water. The city is located at the southernmost point of the Tennessee River on Lake Guntersville, formed by Guntersville Dam. The TVA built Guntersville Dam in 1930 which established Guntersville as a recreation destination. The lake serves as the largest generator of tourism income for Marshall County as people visit to enjoy the lake as well as the state park for camping, hiking and water recreation. Visitors can enjoy an annual powerboat race and wakeboard competition at the Guntersville Lake Hydrofest in June each year.

Guntersville was founded by German immigrant John Gunter, the wealthy owner of a salt mine in the early 1800s. In order to obtain more land to mine, Gunter struck a deal with the Cherokee tribe that inhabited the area. A town sprung up next to the mine and was named after Gunter. The city was incorporated in 1847. During the Civil War, Guntersville was almost destroyed, with all but 7 buildings being decimated. Luckily, its position on the Tennessee River allowed for a quick recovery.

Town of Union Grove

The Town of Union Grove is located in western Marshall County and is the smallest incorporated area of the county. The town is 0.6 square miles and is comprised solely of land. Union

Grove sits at an elevation of 1,027 feet. The majority of Union Grove's residents are employed in the surrounding communities and the Huntsville area.

3. 4 Government

The Marshall County Commission, with their offices located in the county courthouse in Guntersville, is composed of a five-member board: one chairman and four commissioners that are elected by the voters in each of the geographic districts. The chairman is elected from the county at-large. The entire commission serves a staggered four-year term.

All municipalities are governed by a mayor-council form of government, as described below:

- The City of Albertville is governed by a mayor and a five-member city council elected at-large, every five years.
- The Arab City Council is comprised of a mayor and five council members who stand for election every four years. Members represent "places" or "seats" rather than running from a geographic district. Elections are city-wide.
- The City of Boaz is governed by a mayor and five-member city council who are elected at-large.
- The Town of Douglas is governed by a mayor and five-member town council who are elected at-large.
- The Town of Grant is governed by a mayor and a five-member town council who are elected at-large; they serve four-year terms.
- The City of Guntersville is governed by a mayor and seven council members who are elected by district.
- The Town of Union Grove is governed by a mayor and a five-member town council elected at-large.

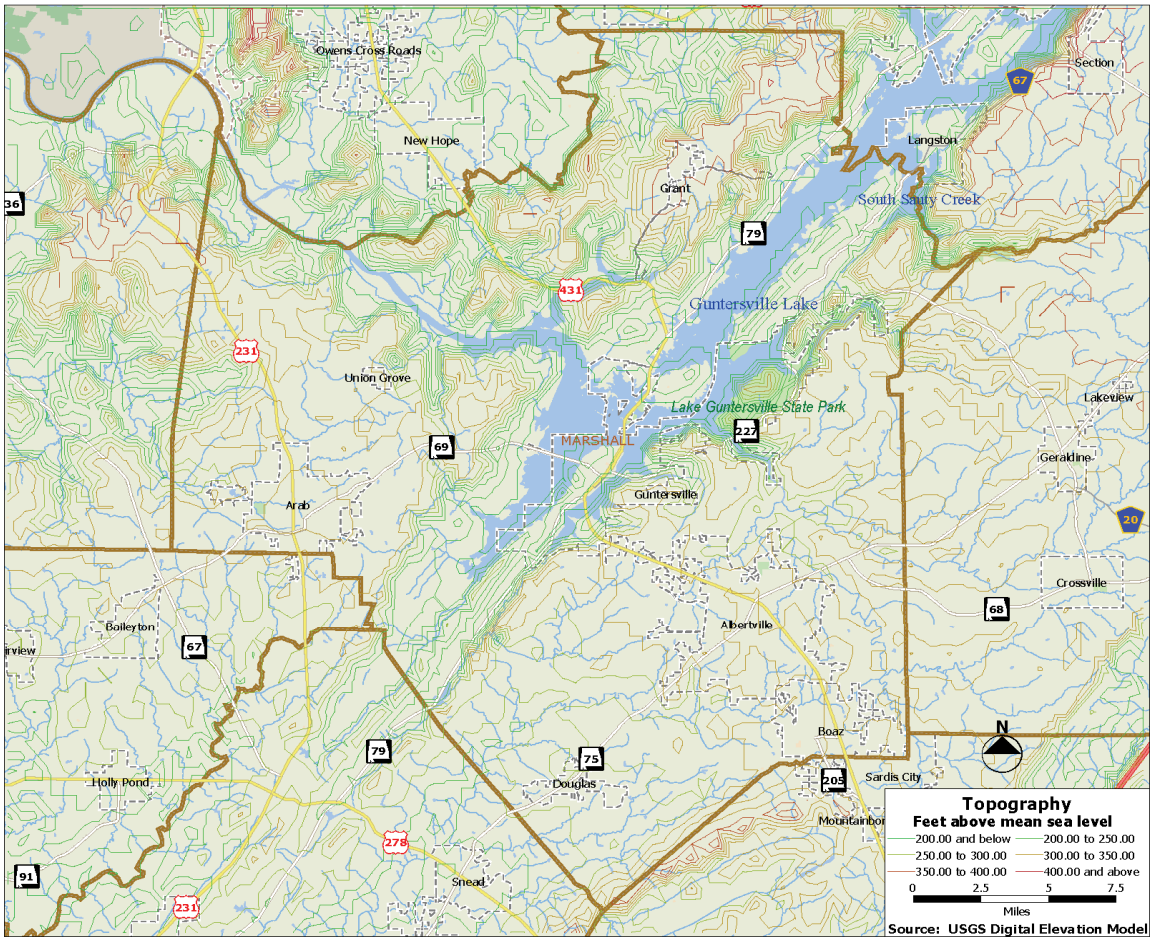
3.5 Physical Features

Marshall County has an area of approximately 627 square miles with 56 square miles covered by Guntersville Reservoir. The County is divided into three physiographic divisions - sandstone plateaus, rough mountain slopes, and limestone valleys. The anticlinal valley that runs from the southwest to the northeast across the center of the county is approximately 3 miles wide. From the northeast of the county through the valley to Guntersville is the Tennessee River. The river turns northwestward from Guntersville and flows through a valley cut by its flow. The anticlinal valley and the Tennessee River Valley cut the county into three segments. Deep, steep-walled geologic erosion channels dissect the undulating plateaus.

Rough mountain slopes extend into the limestone valleys from the edges of the plateaus. Gunters Mountain is to the north of the Tennessee River, Sand Mountain is to the east of the anticlinal valley, and Brindley Mountain is to the west of the valley. Gunters Mountain is the

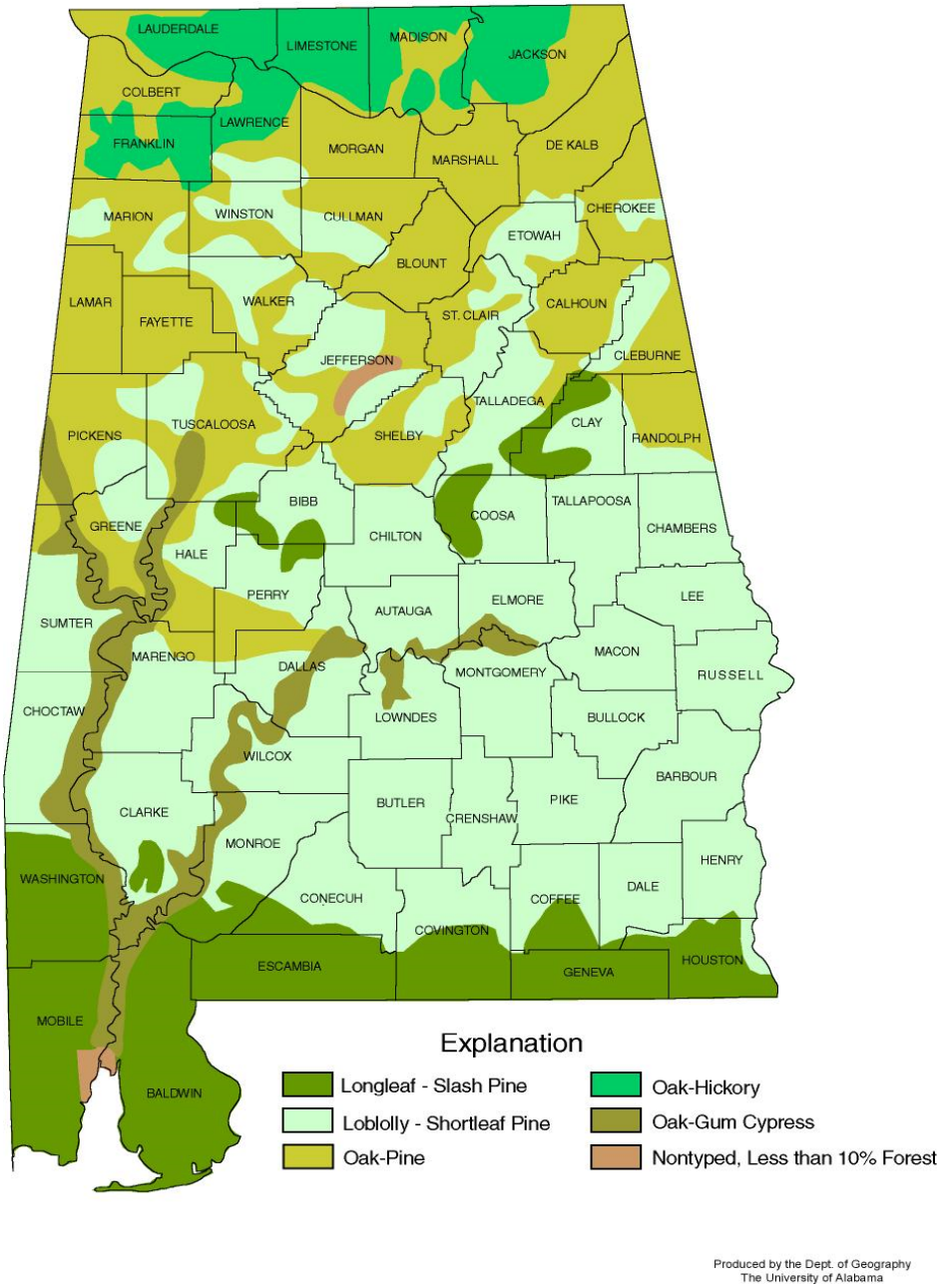
highest plateau. Most of the county's waterways drain into the Tennessee River and the county's most southern portion drains to the southwest to the branches of the Locust Fork or the Black Warrior River. Map 3-3 shows the topography of Marshall County courtesy of the USGS.

Map 3-3. Marshall County Topography



Approximately 142,000 acres of Marshall County's 362,918 acres are forestland (Alabama Forestry Commission, 2020). The dominant tree varieties in Marshall County's forests are oak and pine, which are commonly used in furniture, flooring, and roofing. Marshall County's location within Alabama's distribution of forest types is depicted in Map 3-4 "Alabama Forest Types."

Map 3-4. Alabama Forest Types



3.6 Climate

Marshall County's climate is humid with cold winters and hot summers. The total annual rainfall is approximately 55 inches. The mean winter temperature is 43.5 degrees Fahrenheit and the mean summer temperature is 78.2 degrees Fahrenheit. Marshall County sees an average seasonal snowfall of 1 inch. Table 3-1 shows the weather observations for Marshall County.

Table 3-1. Marshall County Weather Observations

Category	Observation
Average Winter Temperature	43.5° F
Average Winter Minimum Temperature	31° F
Lowest Temperature (January 21, 1985)	-11° F
Average Summer Temperature	78.2° F
Average Summer Maximum Temperature	89° F
Highest Temperature (July 17, 1980)	106° F
Total Annual Precipitation	55 inches
Heaviest One-Day Rainfall (September 6, 2007)	8.9 inches
Average Season Snowfall	1.0 inches

Source: Bestplaces.net, 2020

3.7 Demographics

General demographic information that is gathered through the US Census Bureau is provided in the following sections. An important demographic which is not included is those individuals with disabilities. Disabled individuals present a unique challenge when it comes to ensuring the safety of these individuals, be it through ADA accessible shelters or making sure those who are electricity dependent have the proper provisions to ensure uninterrupted electricity during hazard events. According to the Health and Human Services data on EmPOWER, there are approximately 1,335 electricity dependent individuals residing in Marshall County as of 2020. These are just individuals who rely on Medicare and Medicaid services so the overall number of electricity dependent individuals could be larger. These individuals should be considered in all aspects of the planning process.

Population Growth and Density

Marshall County has experienced an increase in population over recent decades. In 2018, the population of the county was 94,109, a 3.3% increase over the 2010 population of 93,019. Table 3-2 shows the population of the county and its jurisdictions, as well as their percent change from 2000-2010 and 2010-2018 according to the U. S. Census Bureau.

Table 3-2. Marshall County Population Change from 2000 to 2018

Jurisdiction	2000	2010	Number Change	Percent Change	2018	Number Change	Percent Change
Marshall County	82,231	93,019	10,788	13.1%	94,109	1,090	1.2%
Albertville	17,247	21,160	3,913	22.7%	21,568	408	1.9%
Arab	7,174	8,050	876	12.2%	8,321	271	3.4%

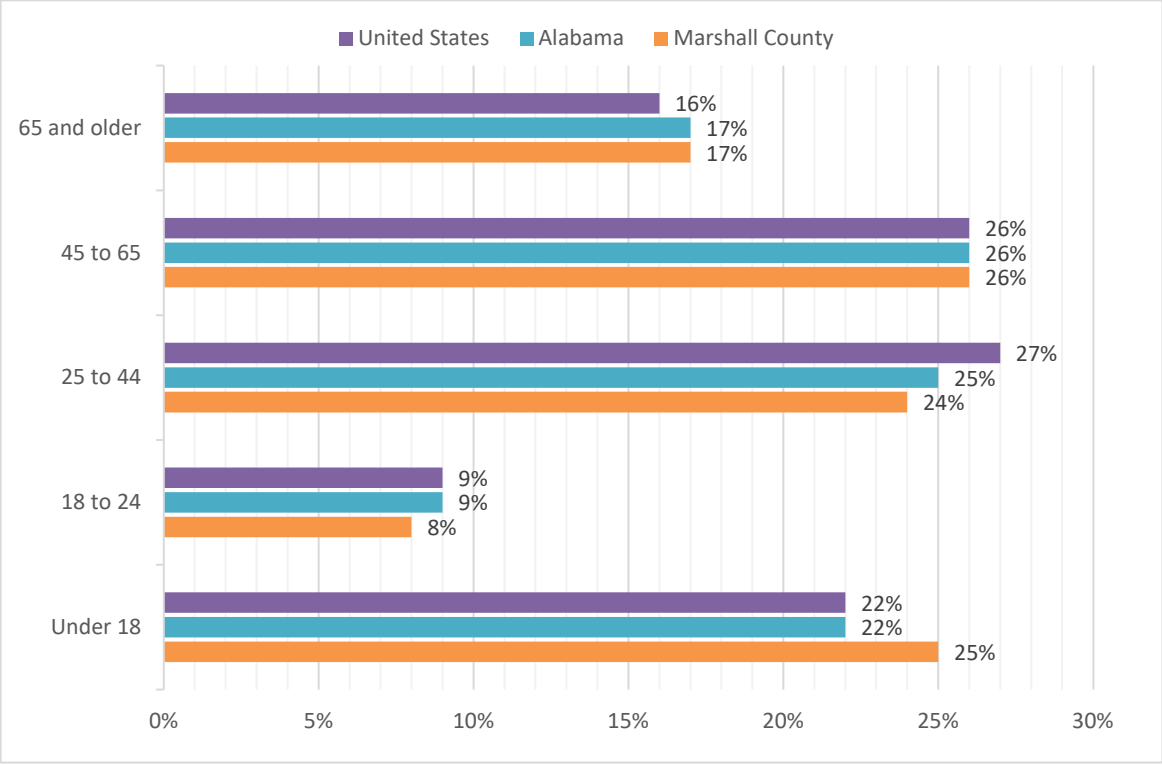
Jurisdiction	2000	2010	Number Change	Percent Change	2018	Number Change	Percent Change
Boaz	7,411	9,551	2,140	28.9%	9,656	105	1.1%
Douglas	530	744	214	40.4%	772	28	3.8%
Grant	665	896	231	34.7%	913	17	1.9%
Guntersville	7,395	8,197	802	10.9%	8,482	285	3.5%
Union Grove	94	77	17	-18%	79	2	2.6%

Source: U.S. Census Bureau, 2018

Age Distribution

The 2018 Census Bureau information indicates that Marshall County's population has an almost equal distribution of residents under the age of 18 (25%), ages 25 to 44 (24%), and ages 45 to 64 (26%). The 18 to 24 age group comprises only 8% of the residents which might result from college aged residents enrolling in school outside of Marshall County. Although Snead State Community College is located in Boaz, Marshall County does not have any major colleges or universities so residents must leave the county in order to obtain a 4-year degree. As can be seen by the 1% decrease in population from those under the age of 18 to those 25-44 years old, it might indicate that a majority of those who leave for college return once their education is complete. This is shown in Chart 3-1.

Chart 3-1. Marshall County Population by Age



Sources: US Census Bureau, 2017

The 25 to 64 age group comprises 50% of the total population. Because this age group is traditionally the most socially and economically productive, this age group is an important asset in realizing the county's full potential. Approximately 17% of the county's population is 65 and over, and because this age group requires certain accommodations such as specialized healthcare and residential facilities as well as elderly and public assistance programs, it is important to be cognizant of this subset of the population. Comparisons of Marshall County to the State of Alabama and the U.S. show relatively no difference.

Race and Gender

According to 2017 Census Bureau data, (Table 3-4) whites comprise 92.6% of the population throughout Marshall County. African-Americans comprise 2.2% of the total Marshall County population and the Hispanic population comprises 13.3% in the county as a whole. The distribution by race per jurisdiction is shown in Table 3-3.

Table 3-3. Marshall County Population by Race and Hispanic Origin

Community	Race						Hispanic (Any Race)
	White	Black/African American	American Indian	Asian	Other Race	Two or More Races	
Marshall County	92.6%	2.2%	0.7%	0.6%	2.1%	1.9%	13.3%
Albertville	92.8%	3.0%	0.2%	0.6%	2.5%	1.0%	29.1%
Arab	95.8%	0.8%	0.4%	1.2%	0.5%	1.4%	1.5%
Boaz	95.7%	2.1%	0%	0.4%	0.3%	1.4%	11.9%
Douglas	98.6%	0%	0%	0%	1.0%	0.4%	7.4%
Grant	97.0%	0.2%	0.2%	0%	0%	2.7%	1.4%
Guntersville	83.6%	12.2%	0.3%	1.2%	0.9%	1.9%	2.7%
Union Grove	100%	0%	0%	0%	0%	0%	0%

Sources: U.S. Census Bureau, 2017

Table 3-4 shows that the county is divided as 50.6% female and 49.4% male. The female population outnumbers the male population in all jurisdictions, except for Boaz and Union Grove, where males outnumber females by 2.4% and 7.2% respectively.

Table 3-4. Marshall County Population by Gender

Community	Male	Female
Marshall County	49.4%	50.6%
Albertville	48.6%	51.4%
Arab	47.2%	52.8%
Boaz	51.2%	48.8%

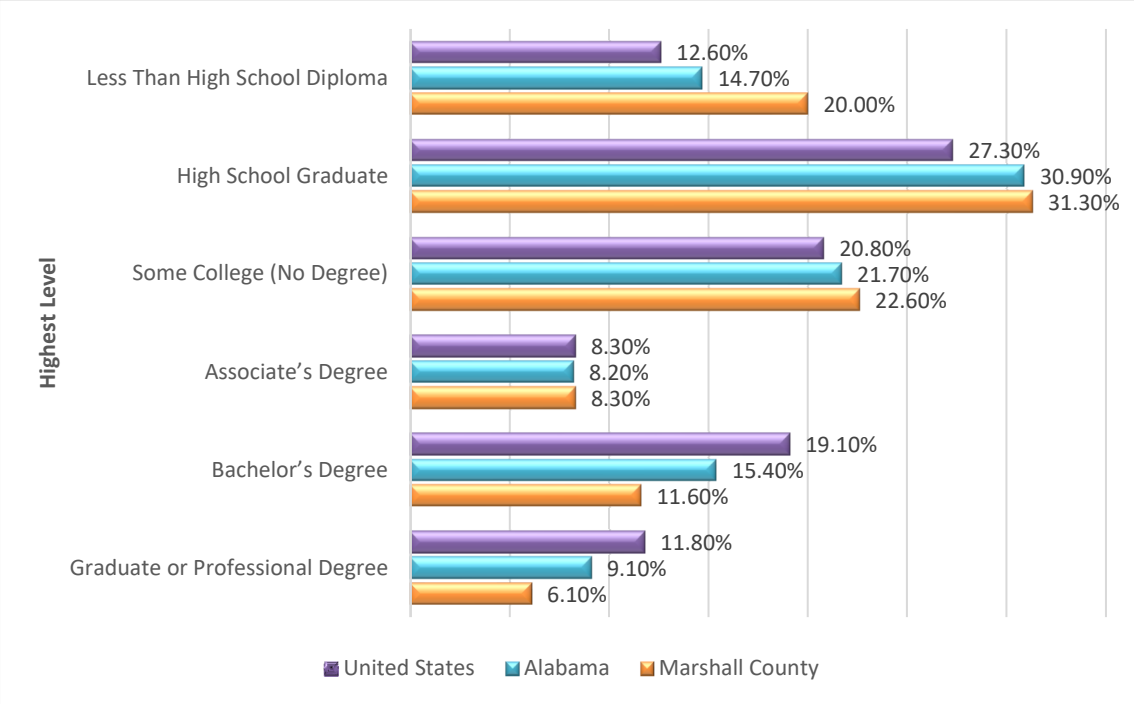
Community	Male	Female
Douglas	47.8%	52.2%
Grant	44.7%	55.3%
Guntersville	47.4%	52.6%
Union Grove	58.6%	41.4%

Source: U.S. Census Bureau, 2017

Educational Attainment

Of Marshall County's population of 25 years or older, approximately 80 percent are high school graduates or higher which is a 5% increase since the 2012 estimate, and over 17% percent of those have a bachelor's degree or higher. Relative to the State of Alabama and the United States, Marshall County has a larger population receiving less than a high school diploma, but is comparable in terms of those who have attended some college and/or received an associate's degree. Chart 3-2 depicts the educational attainment of Marshall County residents, according to the U.S. Census Bureau.

Chart 3-2. Marshall County Educational Attainment for 25 Years Old and Older



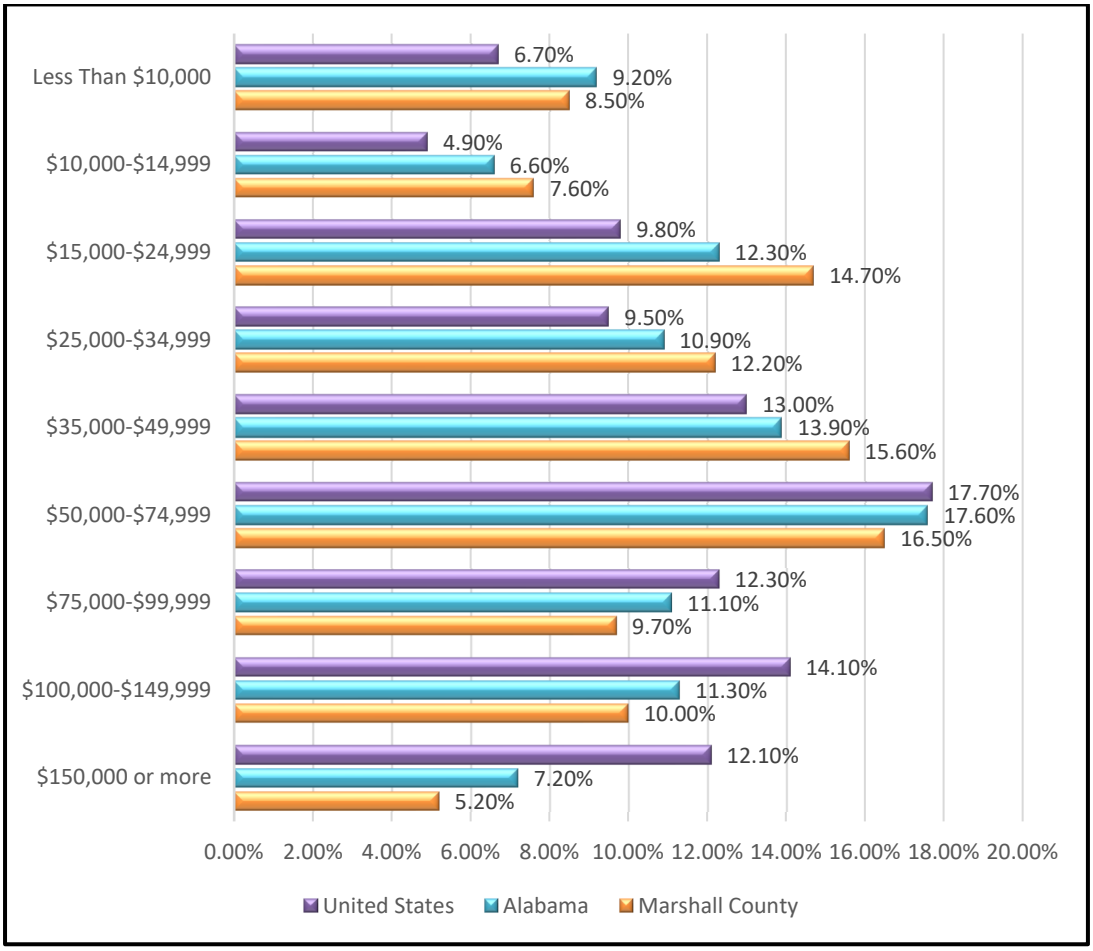
Source: U.S. Census Bureau, 2017

Income

The median household income for Marshall County is $41,104 compared to a state average of $46,472, and U.S. average of $57,762, according to 2017 Census Bureau data. Two of the jurisdictions in Marshall County have a median household income exceeding that of the state – Grant at $54,583 and Union Grove at $68,750. Currently, the towns of Grant and Union Grove and the cities of Arab

and Guntersville have poverty levels that are lower than or equal to that of the state; all other jurisdictions' poverty levels exceed the state level by more than 0.5%. The town of Douglas currently has the highest percentage of residents below the poverty level at 26.6% and Union Grove currently has no residents under the poverty level. Chart 3-3 and Table 3-5 depict the median household income and poverty level data comparison for the jurisdictions in Marshall County, the State of Alabama, and the United States. The poverty level was $24,600 for a family of four in 2017.

Chart 3-3. Marshall County Household Income Distribution



Source: U.S. Census Bureau, 2017

Table 3-5. Comparison of Income and Poverty Levels

Geographic Area	Median Household Income	Persons Below Poverty Level	Percent Below Poverty Level
Marshall County	$41,104	19,654	21.0%
Albertville	$37,619	6,042	28.7%
Arab	$43,884	1,417	17.6%
Boaz	$41,488	1,740	18.7%

Geographic Area	Median Household Income	Persons Below Poverty Level	Percent Below Poverty Level
Douglas	$41,667	319	26.6%
Grant	$54,583	111	10.9%
Guntersville	$42,308	1,467	18.2%
Union Grove	$68,750	0	0%
Alabama	$46,472	849,699	18.0%
U.S.	$57,652	45,650,345	14.6%

Source: US Census Bureau 2017

Housing

Chart 3-4 "Housing Stock by Age" shows that the majority of housing in Marshall County was constructed between 1960 and 1999, comprising 70.7% of total housing stock. This trend is similar to Alabama and the U.S. The majority of owner-occupied housing values fall within the $50,000 to $99,999 range, totaling 6,690 (27.4%). Housing values ranged from 3,439 units at less than $50,000 to 235 units valued at $1,000,000 or more (see Chart 3-5). The median value for a home in Marshall County in 2017 was $118,500 according to the US Census Bureau.

Chart 3-4. Marshall County Housing Stock by Age

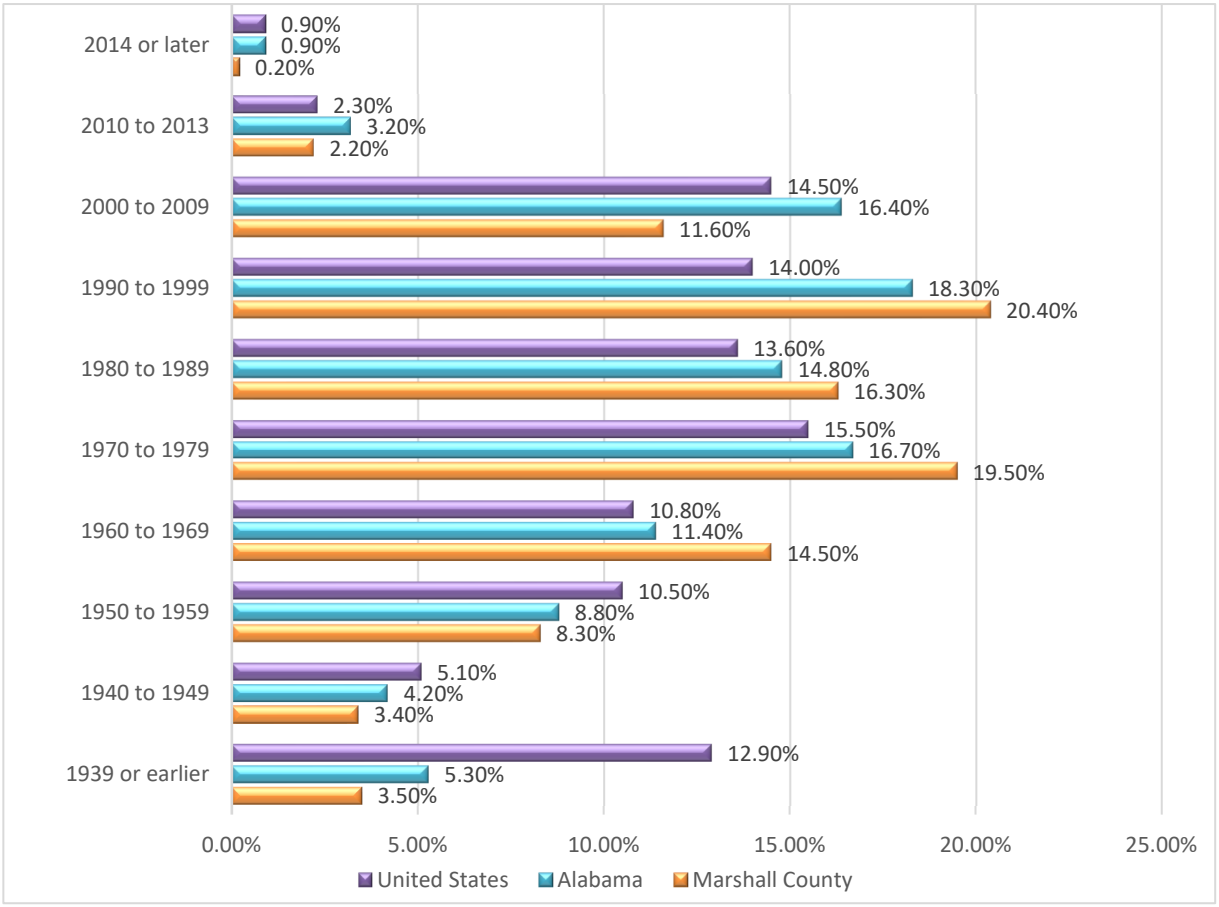
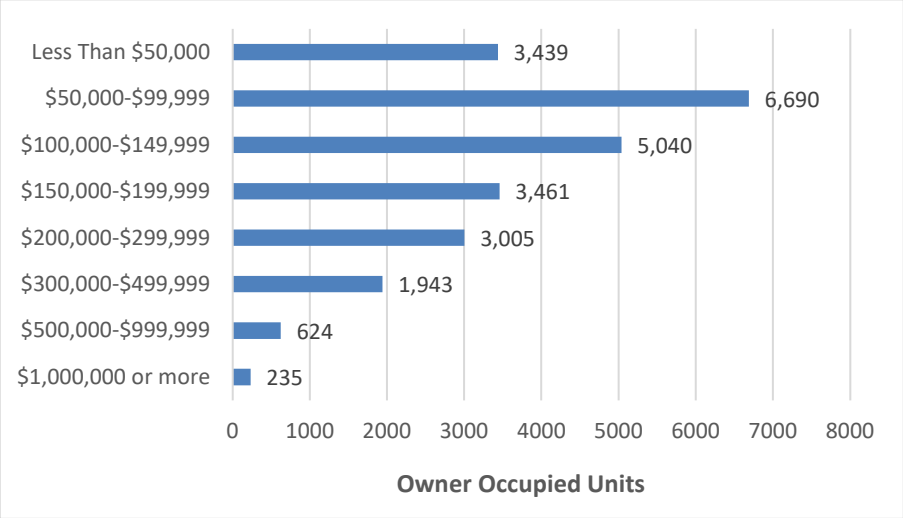


Chart 3-5. Marshall County Housing Units by Value



3.8 Economy

Business and Industry

The poultry industry is the largest industry in Marshall County. Pilgrim's Pride leads this industry, employing approximately 1,500 people, followed by OK Foods (950), Wayne Farms (938), Tyson Foods (927) and AlaTrade Foods, LLC. (600) for a total employment of over 8,000 people in the poultry processing industry. These processing plants are located in Guntersville and Albertville. The largest employer in Boaz is TS Tech Alabama, an automobile parts manufacturing plant, with over 700 employees. Orchid Orthopedic Solutions and Atrion Medical Products are the two largest employers in Arab, employing 130 and 128 people, respectively. Map 3-5 shows the locations of major employers in Marshall County. Table 3-6 "Major Employers" lists the businesses that employ 50 or more people in Marshall County according to the Marshall County Economic Council.

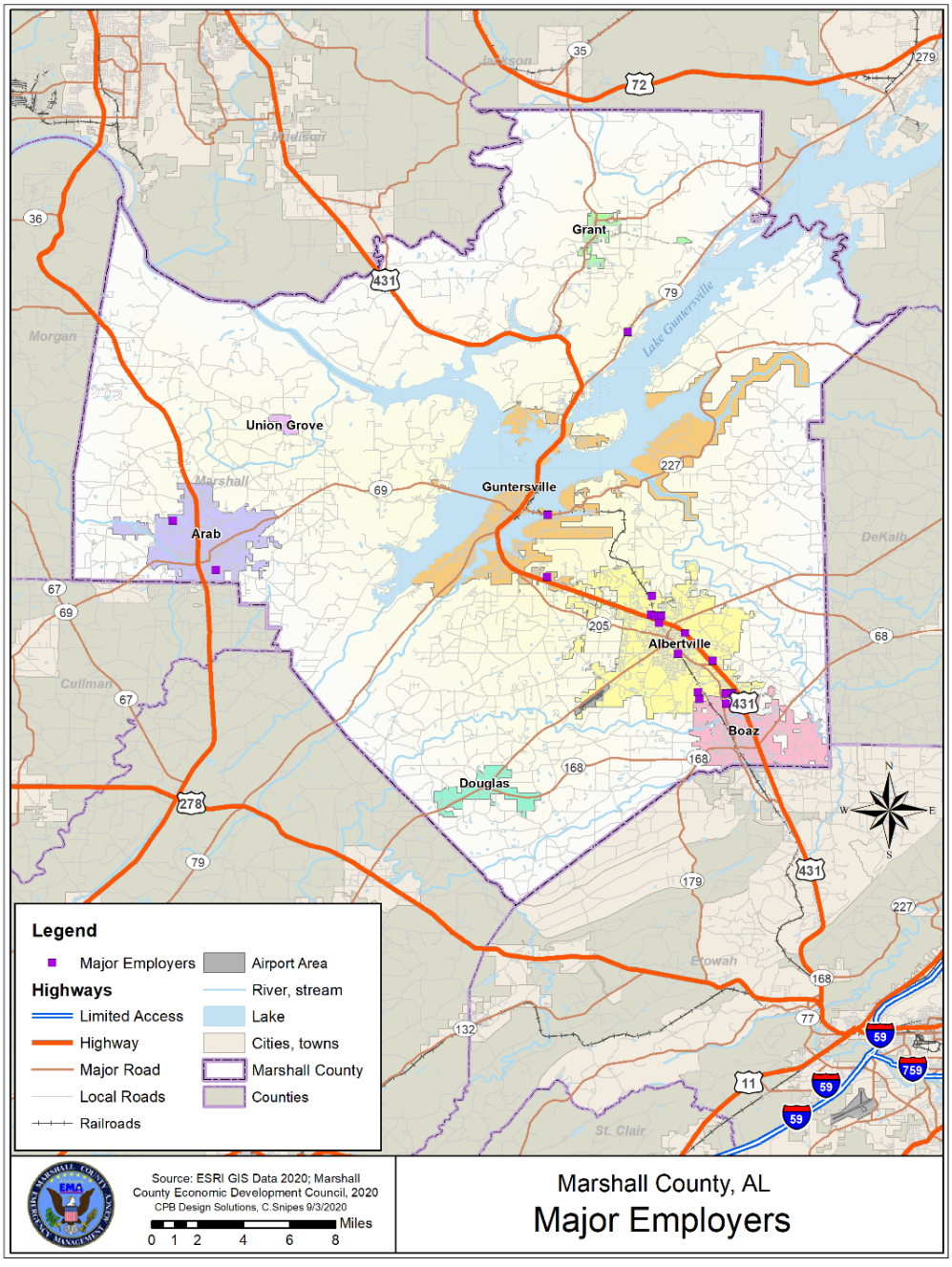
Table 3-6. Marshall County Major Employers

Company	Number of Employees	Product	Location
Pilgrim's Pride	1500	Poultry Processing	Guntersville
OK Foods	950	Poultry Processing	Albertville
Wayne Farms	938	Poultry Processing	Albertville
Tyson Foods, Inc.	927	Poultry Processing	Albertville
TS Tech Alabama	773	Mfg. Automobile Parts	Boaz
Colormasters, LLC	700	Polyethylene Plastic Bags	Albertville
AlaTrade Foods, LLC	600	Poultry Further Processing	Guntersville
Mitchell Grocery Corporation	500	Distributes Groceries	Albertville
Mueller Co.	500	Fire Hydrants	Albertville
Newman Technology	350	Automotive Components	Albertville

Company	Number of Employees	Product	Location
Progress Rail Service	350	Railcar Components	Albertville, Boaz, Arab
Diamond Foods	302	Livestock Services	Albertville
Kabco Builders	190	Home Builders	Boaz
Huhtamaki Retail Bus. Unit/Chinet Co.	160	Molded Fiber Products	Albertville
Parker-Hannifin Corp.	152	Hardware Retail/Home Centers	Boaz
Federal-Mogul	150	Auto Wheel & Master Cylinders	Boaz
Kappler, Inc.	150	Chemical Protective Clothing	Guntersville
Kennametal	148	Machinery	Grant
Orchid Orthopedic Solutions	130	Orthopedic Mfg.	Arab
Atrion Medical Products, Inc.	128	Medical Device Mfg.	Arab
Factory Connection, Inc.	125	Clothing Store	Guntersville
Hyco Alabama, LLC	123	Hydraulic Cylinders	Arab
Pinnacle Mfg., LLC	100	Tank Building	Boaz
Arab Cartage & Express Co, Inc.	85	Trucking Services	Arab
Associate Jobbers Warehouse	80	Automotive Parts Distributor	Boaz
B&G Supply Company, Inc.	80	Transportation Trucking Co.	Albertville
Paragon Decors, Inc.	80	Wall Décor	Albertville
Warren Distribution	74	Mix & Distribute Motor Oil	Guntersville
Syncro Corp.	71	Industrial Controls	Arab
Faithway Feed Company, Inc.	65	Animal Feeds/Elevator	Guntersville
Tyson Foods Hatchery	61	Hatchery	Albertville
FABCO Equipment Co.	55	Meat/Poultry Processing Equip.	Albertville
Propac Images	55	Promotional Framed Art Work	Albertville
BPI Media Group	54	Commercial Printing	Boaz
Umicore Specialty Chemicals	53	Chemicals	Arab
BAE Systems	50	Aerospace Systems	Albertville
Bakery Feeds	50	Recycling of Bakery Products	Albertville
Lowery Mfg., Inc.	50	Farm Machinery	Boaz

Source: Marshall County Economic Development Council, 2019

Map 3-5. Marshall County Major Employers



3.9 Utilities

Electric Power

Electric power is provided by Alabama Power, the Albertville Municipal Utilities Board (Albertville), Arab Electric Cooperative (Arab), Huntsville Utilities, North Alabama Electric Cooperative (Stevenson), Guntersville Electric Board (Guntersville), Cherokee Electric Cooperative (Marshall

County), Marshall-DeKalb Electric Cooperative (Boaz), Sand Mountain Electric Cooperative (Marshall County), and the Tennessee Valley Authority.

Natural Gas

Natural gas is provided by the Marshall County Gas District for all areas other than Boaz either directly or through other distributors. The Boaz Gas Board provides natural gas for the Boaz area.

Water and Sewer

Water and sewer service is provided by Albertville Municipal Utilities Board, Arab Water & Sewer, Asbury Water Services, Boaz Water & Sewer, Douglas Water Board, Guntersville Water and Sewer Board, North Marshall Utilities (Grant), Northeastern Alabama Water, Swearengin Water System, and Union Grove Utility Board.

3.10 Media

Cable and Satellite TV

AT&T, Charter Communications, Horizon Communications, New Hope Telephone Cooperative, North Alabama Electric Cooperative, and Otelco provide cable service for areas within Marshall County. Satellite television is also available throughout the county.

Newspapers

The Advertiser Gleam out of Guntersville, the Sand Mountain Reporter out of Albertville, and the Arab Tribune of Arab are the local newspapers for Marshall County. Residents also receive the Huntsville Times, the Gadsden Times, and the Birmingham News.

Telephone Services

Providing telephone and cellular services are the following companies: AAA Communications, AT&T, Bellsouth, Cherokee Telephone Company, Cingular Wireless, Cool-Com, Corr Wireless, East Alabama Electronic, Inc., Farmers Wireless, New Hope Telephone Cooperative, Otelco, Verizon Wireless, and Wireless Advantage. American Telegraph Service and Western Union provide telegraph services.

Radio

Local radio stations include: WAFN-FM 92.7 – Arab, WQSB-FM 105.1 – Albertville, WAVU-AM 630 – Albertville, W298BG-FM 107.5 – Albertville, WTWX-FM 95.9 – Guntersville, WGSV-AM 1270 – Guntersville, WBSA-AM 1300 – Boaz, WRAB-AM 1380 – Arab, WJIA-FM 88.5 – Guntersville, WWGC-AM 1090 – Albertville, and WZZN-FM 97.7 – Union Grove.

3.11 Transportation

Major Roadways

Marshall County is served by a four-lane highway system with access to Interstates 59 and 65. Major highways in the county include U.S. Highways 431 and 231, and six State Highways: 69, 75, 79, 168, 205, and 227.

Railway

The Alabama-Tennessee Railway serves Marshall County through OmniTrax. OmniTrax has a lease agreement with CSX, which connects to the CSX mainlines, as well as Norfolk Southern lines. This rail line extends 120 miles from Birmingham to the rail barge terminal at the Port of Guntersville located along the Tennessee River.

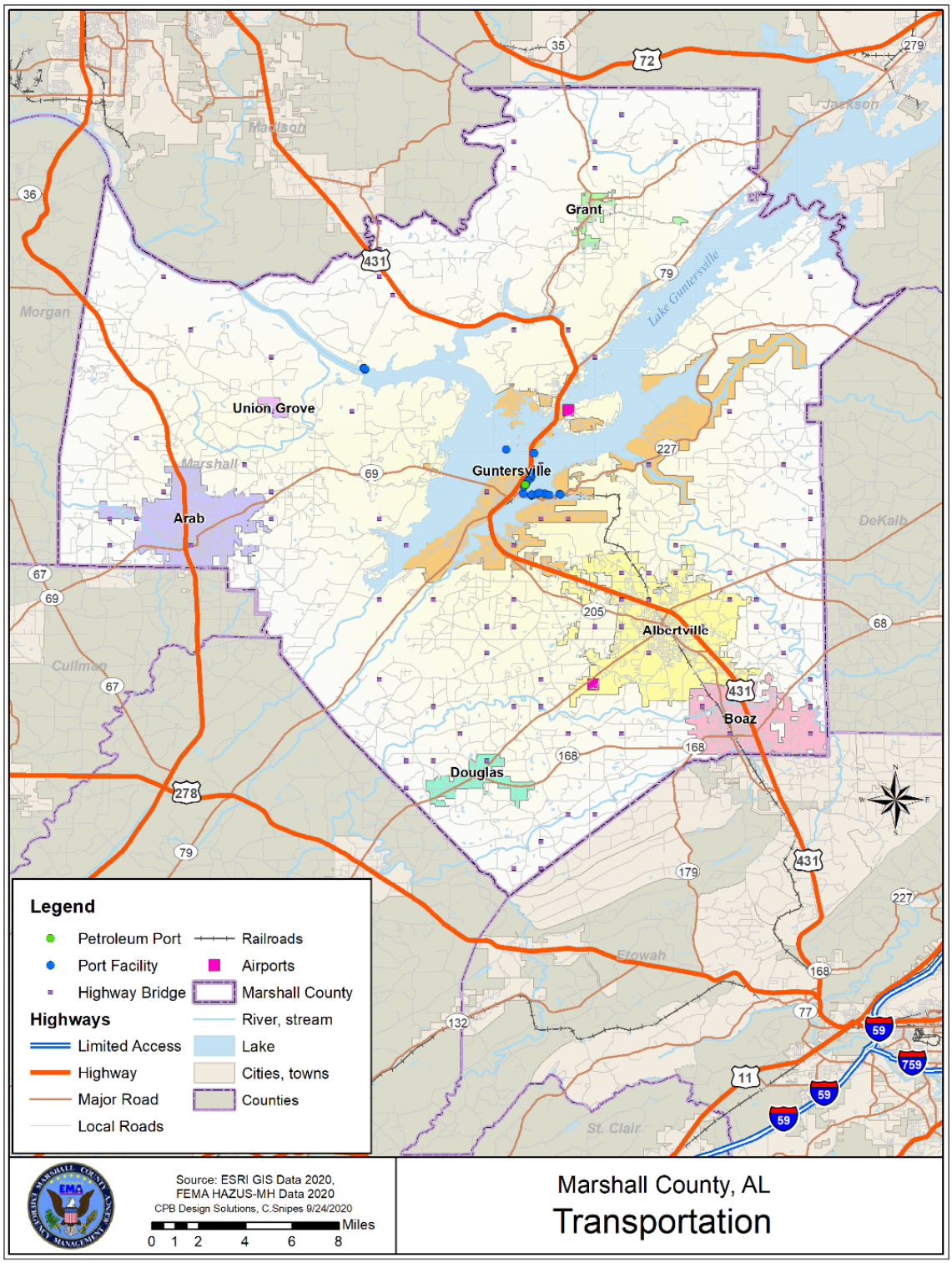
Airports and Heliports

There are two municipal airports, one in Guntersville and the other in Albertville, providing service to small private and commercial aircraft. There is a heliport located near Lake Guntersville State Park. The Huntsville and Birmingham International Airports are 45 and 60 miles from Guntersville, respectively. Chattanooga Metropolitan Airport is 90 miles from Guntersville and Atlanta-Hartsfield International Airport is 150 miles from Guntersville.

Waterways

Flowing through Marshall County is the Tennessee River. This river has a navigable depth of 9 feet, which connects to the Tennessee Tombigbee Waterway and the Mississippi River. Lake Guntersville is formed from the Tennessee River. The Guntersville Dam is a hydroelectric dam that is approximately 94 feet in height and has a generating capacity of 97,200 kW. The port facilities of the Port of Guntersville are located along the Tennessee River in Guntersville. Paint Rock River forms a portion of the county's northern boundary, and several tributaries of the Black Warrior River run through the southwest part of the county. Map 3-6 shows the major transportation infrastructure for Marshall County.

Map 3-6. Marshall County Transportation



Chapter 4 - The Planning Process

4.1 Federal Requirements for the Planning Process
4.2 Summary of Plan Updates
4.3 The Marshall County Hazard Mitigation Planning Committee
4.4 Opportunities for Involvement in the Planning Process
4.5 How the Plan was Prepared
4.6 Review and Incorporation of Applicable Plans and Documents
4.7 The Plan Review and Update Process
4.8 Opportunities for Public Comment on the Plan

4.1 Federal Requirements for the Planning Process

This chapter of the Plan addresses the Planning Process requirements of 44 CFR Section 201.6 (b) and (c)(1) and the process for the plan review and update requirements of Section 201.6 (d)(3), as follows:

> "201.6 (b) *Planning process.* An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:
>
> (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
>
> (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
>
> (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information. "
>
> "201.6 (c) *Plan content.* The plan shall include the following:
>
> (1) Documentation of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved."
>
> "201.6 (d) *Plan review.*
>
> (3) A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding."

4.2 Summary of Plan Updates

Changes to Chapter Four from the 2014 plan include a new arrangement to the order of the sections and the section on public involvement was combined with the opportunities for involvement section. The Hazard Mitigation Planning Committee was reorganized to include some new members and a new information gathering tool, "Thoughts Sheets" was incorporated into the planning process.

4.3 The Marshall County Hazard Mitigation Planning Committee

Members of the committee included representatives from the participating jurisdictions, school officials, agency representatives, and other interested parties. The public was welcomed to participate in all the meetings that occurred since the kick-off meeting on October 23, 2019.

4.3.1 Members of the Hazard Mitigation Planning Committee

The Marshall County Hazard Mitigation Planning Committee (HMPC), comprised of representatives from the incorporated jurisdictions within Marshall County and organizations concerned with hazard mitigation, guided the development of this plan. The following is a list of those who participated in the planning process and the jurisdictions and/or organizations they represented.

Alan Garner, Assistant Superintendent Marshall County Schools
Allen Johnson, Superintendent Support Services Boaz City Schools
Anita McBurnett, Director Marshall County EMA
Audra Ford, Director Emergency Department Marshall Medical Centers
Blake Farmer, Lieutenant City of Boaz Fire Department
Bo McRee, Supervisor Transportation/Safety Guntersville City Schools
Bob Pirando, County Engineer Marshall County
Brad Hix, Fire Chief City of Albertville Fire Department
Brad Kitchens, Coordinator Support Services Arab City Schools
Brian Waldrop, Fire Chief City of Guntersville Fire Department
Buddy Pettry, Fire Marshall City of Guntersville Fire Department
Candece Adkins, RN Emergency Preparedness Alabama Department of Public Health
Carolyn Garrett, Court Clerk Town of Douglas
Dameon Pittenger, Zoning Administrator City of Arab
Dennis Myers, Patrolman City of Guntersville Police Department
Drew Gardner, Assistant Superintendent Street Dept City of Boaz
Dusty Walker, Ranger Alabama Forestry Commission
George Harwell, Operations Specialist Marshall County EMA
Greg Peppers, Safety Coordinator Albertville City Schools
Jacob Babb, EMS Director Marshall Medical Centers
Jared Baker, Captain City of Guntersville Fire Department
Jason Beam, Assistant Fire Chief/Fire Marshall City of Albertville Fire Department

Jim Peterson, Police Chief City of Guntersville Police Department
Jimmy Hanson, Building Official City of Guntersville
Jimmy Hopper, Maintenance Director Marshall Manor Nursing and Rehab Facility
Joe Whitmore, President Snead State Community College
Joey Baker, District Commissioner Marshall County Commission District 4
Johnny Berry, School Superintendent Arab City Schools
Kenny Smith, Superintendent Street Dept City of Boaz
Kim Mayes, Administrative Assistant Marshall County EMA
Laurie Peeler, Town Clerk Town of Douglas
Leah Keith, Federal Programs Coordinator Arab City Schools
Linda Robertson, Administrator Marshall Manor Nursing and Rehab Facility
Luke Lathan, Lieutenant/Paramedic City of Albertville Fire Department
Mark Thompson, Building Inspector City of Albertville
Michael Knop, Assistant County Engineer Marshall County
Michael Tucker, Director of Public Works City of Albertville
Michael Williams, Forestry Management Specialist Alabama Forestry Commission
Nick Bonds, IT/Comms Officer Marshall County EMA
Nick Borden, Building Inspector City of Boaz
Paul Gore, Director of Security Snead State Community College
Phil Sims, Sheriff Marshall County
Phillip Goodson, Town Clerk Town of Grant
Rickey Watson, District Commissioner Marshall County Commission District 2
Ricky Phillips, Fire Chief City of Arab Fire Department
Ronny Shumate, District Commissioner Marshall County Commission District 1
Ryan Darnell, Captain City of Guntersville Police Department
Sarah Bunch, Town Manager Town of Union Grove
Shane Washburn, Assistant Police Chief City of Arab Police Department
Stacey White, General Manager Arab Electric
Steve Williams, Facility Director Snead State Community College
Tim Tidmore, Deputy Superintendent Albertville City Schools
Will Kennamer, GIS Specialist Marshall County EMA

Through the passage of a resolution for representation, the towns of Union Grove and Douglas were represented by the Marshall County EMA. Kay Johnson, a resident of Albertville and the director of Marshall County Animal Advocates, attended all planning meetings although she was not an official HMPC representative.



4.3.2 The Mission of the Hazard Mitigation Planning Committee

The Committee retained the following mission statement from previous plans:

The mission of the Marshall County Hazard Mitigation Planning Committee is to oversee and establish a comprehensive hazard mitigation planning process that engages public participation and support; facilitates Federal, state, regional and local agencies' coordination; constantly monitors and evaluates the potential risks of hazards to life and property; actively mobilizes all available community resources and measures to mitigate the threats of hazards; and, results in programmed actions with specific results.

4.4 Opportunities for Involvement in the Planning Process

The public and local and regional agencies were provided opportunities to participate in the plan update. Those opportunities ranged from being an active participant during committee meetings to offering comments through the plan website, emails, or other avenues. All Hazard Mitigation Planning Committee meetings were announced through the plan update website. Representatives from the media did not attend any meetings due to the COVID-19 outbreak.

The public was encouraged to offer their input and comments via the website's email account at hazardmitigationplans.com. Drafts of the plan chapters were available for review on the plan website. The Marshall County EMA made a number of attempts to encourage participation by the media, public and area agencies through emails once the draft plan was complete. An image of the home page for the site is on the final page of this chapter. At the end of the planning process, the

public was invited to attend public hearings held by all jurisdictions for plan adoption by each of the governing bodies, allowing individuals a final opportunity for public comment.

Data for the plan update was made available from many agencies such as the National Weather Service, the United Geological Survey of Alabama, the Army Corps of Engineers, the Alabama Forestry Commission, and many others. Emails were sent to various local and regional agencies with an interest in hazard mitigation, agencies that have the authority to regulate development, and representatives of businesses, academia and other private and non-profit interests notifying them of the draft plan and requesting their input and cooperation. (A copy of the emails is included in Appendix H). Those agencies which received the notice are listed below.

Federal Agencies

- National Weather Service - Huntsville Office
- U.S.D.A. Natural Resources Conservation Service – Alabama District
- U.S. Army Corps of Engineers – Mobile District
- U.S. Army Corps of Engineers – Nashville District
- Tennessee Valley Authority
- FEMA
- FEMA Region IV

State Agencies

- Alabama Emergency Management Agency (AEMA)
- Alabama Department of Economic and Community Affairs (ADECA)
- Alabama Department of Environmental Management (ADEM)
- Alabama Department of Transportation (ALDOT), First Division, District 4, Marshall County
- Alabama Forestry Commission
- Geological Survey of Alabama
- Lake Guntersville State Park
- Alabama Historical Commission

Local and Regional Agencies

- Top of Alabama Regional Council of Governments
- Marshall County Economic Development Council
- North Alabama Industrial Development Association

Neighboring Counties (represented by county EMA directors)

- Madison County
- Morgan County
- Cullman County
- Blount County
- Etowah County

- DeKalb County
- Jackson County

Chambers of Commerce

- Albertville Chamber of Commerce
- Arab Chamber of Commerce
- Boaz Chamber of Commerce
- Grant Chamber of Commerce
- Lake Guntersville Chamber of Commerce

Academia

- Marshall County School Board
- City of Albertville School Board
- City of Arab School Board
- City of Boaz School Board
- City of Guntersville School Board
- Snead State Community College
- Marshall Christian School, Albertville

Non-Profits and Other Agencies

- American Red Cross, Madison-Marshall County Chapter
- DHR
- Marshall Medical Center North
- Marshall Medical Center South
- Salvation Army
- TS Tech Alabama, LLC.
- United Way

In addition to the emails sent out through the Marshall County EMA to area agencies, the Senior Vice President and CFO of the Alabama Rural Electric Association, Karl Rayborn, sent out an email on October 29, 2019 informing all electrical cooperatives in Alabama about the upcoming updates to mitigation plans and the need for them to participate in the planning process of the areas they serve. The Geological Survey of Alabama provided additional information on geohazards that affect Marshall County for the update. Members of the Alabama Forestry Commission reviewed sections of the plan and provided feedback. Also, during the meeting covering wildfires, Michael Williams with the Forestry Commission, was present to answer any questions from those in attendance.

Other than feedback during the planning process from those who were active members of the planning committee as listed in section 4.3.1 and the Forestry Commission, the only feedback received

from agencies outside the committee was from the Army Corps of Engineers who made a general comment on the plan overall but did not provide any specific feedback.

4.5 How the Plan was Prepared

The planning process began with two kick-off meetings. The first kickoff meeting was held October 23, 2019. Due to limited attendance at the first meeting, a second kickoff meeting was held on November 8, 2019. The meeting was held to familiarize participants with the plan update requirements and the steps that would be taken throughout the process. Preliminary exercises were given to the members to ascertain their perceptions of hazards and the risks posed to their jurisdictions by those hazards. They were also asked to fill out information on their jurisdiction's capabilities and the status of mitigation measures from the 2014 plan.

The first risk assessment meeting was held on January 23, 2020. During that meeting, the attendees were provided with a "Thoughts Sheet". They were asked to provide information about the hazard(s) being discussed on the sheet. The information that was provided by the members included: past hazard events, where the event occurred, when the event occurred, other hazards associated with it, the results of the event, and any suggestions they had to lessen the impact of the hazard. The hazards covered during the first risk assessment meeting were hurricanes, severe storms, tornadoes, and floods. Thoughts Sheets were provided for each meeting that hazards were covered.

After the meeting on January 23, 2020, the plan administrator met with the towns of Douglas and Union Grove individually to go over the materials from the kick-off meeting and the information from the day's meeting. Both towns provided information for the plan update and were informed about the opportunity for authorized representation. Both towns agreed to have the Marshall County EMA represent them at the meetings since they do not have enough staff to have someone attend the meetings.

The next meeting was held on February 20, 2020. The hazards covered during the meeting were extreme heat, droughts, sinkholes, wildfires, and landslides. The hazards for the March 12th meeting were winter storms, extreme cold, earthquakes, and dam or levee failure. The meeting scheduled for April was postponed until June due to COVID-19. On June 11, 2020, the meeting was held in person and also virtually. June's discussion covered human-caused and technological hazards as well as pandemics and infectious diseases.

On July 9, 2020, the HMPC met to discuss mitigation strategies. This meeting was held in person and virtually. The members were provided a list of mitigation measures to review. The list was of measures from the prior update and new measures. The new measures were compiled from the discussions and ideas that came forth during the risk assessment meetings. At the end of July and into August, one-on-one meetings with the jurisdictions were conducted to discuss mitigation strategies specific to their jurisdictions. The plan administrator met with representatives from each jurisdiction and reviewed the findings of the capabilities assessment, the implementation status exercise and

possible mitigation measures. These meetings were beneficial because some city and county employees who were unable to make the regularly scheduled meetings at the EMA office, were able to attend the one-on-one meetings at their facilities.

On August 20 and September 24, 2020, the HMPC reconvened to discuss the Threat and Hazards Identification and Risk Assessment. The participants provided information on threats of different hazards, and scenarios were developed and capabilities to address the hazards were evaluated. A final HMPC meeting was scheduled for November; however, due to a severe outbreak of COVID-19 in Marshall County, the meeting was cancelled. The members were instructed to go to the website to review the chapters of the plan and conduct a review of the material. A form was provided to assist them with the review.

On February 23, 2021, the HMPC met for a final time to provide final comments on the plan. The last task for the members in relation to the plan update was to present the plan to their respective jurisdictions for approval.

4.6 Review and Incorporation of Applicable Plans and Documents

There were no new jurisdictional plans or regulations to review since the last update. The City of Boaz was in the middle of developing a comprehensive plan and Guntersville was preparing to adopt a flood plain ordinance. Documents from agencies such as NOAA, FEMA, DHS, and NWS were consulted throughout the planning process. Data provided through the US Census Bureau and Geology Survey of Alabama, among others, were utilized during the plan development.

Jurisdictional plans that incorporate mitigating hazards include:

- Comprehensive plans of the cities of Albertville, Arab, Boaz, Grant, and Guntersville;
- Zoning ordinances of the cities of Albertville, Arab, Boaz, Guntersville, and the town of Grant;
- Building codes of the cities of Albertville, Arab, Boaz, and Guntersville ;
- Subdivision regulations of the cities of Albertville, Arab, Boaz, Guntersville, the towns of Grant and Douglas and Marshall County;
- Flood plain management ordinances for the cities of Albertville, Arab, Boaz, Guntersville, and Marshall County;
- Storm Water Management Plans of the cities of Arab, Boaz, and Guntersville;
- Downtown revitalization plans of the cities of Boaz and Guntersville;
- Open burn ordinance of the town of Grant;
- Critical Incident Management Plans of the cities of Albertville, Arab, and Boaz;
- Erosion and sedimentation control regulations of the city of Arab;
- Mountainside and steep slope development regulations of the city of Guntersville;
- Regulations for commercial logging for the city of Guntersville;
- Water conservation ordinance of Guntersville;
- Solid Waste Management Plan of Marshall County;

- Hazardous Materials Commodity Flow Study of Marshall County;
- Tennessee Valley Authority, Guntersville Dam and Nickajack Dam Emergency Action Plan; and
- Tennessee Valley Authority Guntersville Watershed Plan.

The 2014 mitigation strategy was incorporated into the Marshall County Emergency Operations Plan (MCEOP) administered through the Emergency Management Agency office. From 2014 through 2019, the Marshall County EMA conducted a yearly review of the MCEOP in conjunction with the mitigation actions that were in progress or planned for implementation. The Risk Assessment portion of the plan update was also integrated into the THIRA (Threat and Hazard Identification and Risk Assessment) for Marshall County.

The relevant mitigation strategies developed from this mitigation plan update should be integrated into any revisions of existing comprehensive plans and future planning documents at the appropriate time. Specific measures for plan integration are included in the Community Mitigation Action Programs for each jurisdiction.

4.7 The Plan Review and Update Process

The plan review and update process resulted in a comprehensive update of the 2014 plan elements, which was achieved through a process that involved the following tasks, among others:

- Update of the Community Profiles to reflect changed demographics, economic characteristics, and growth and development trends.
- An assessment of local capabilities to carry out mitigation measures.
- An evaluation of the implementation status of the mitigation measures of the Community Mitigation Action Programs for each jurisdiction that were adopted in the 2014 plan.
- A reassessment of risks to include detailed research and analysis of hazards affecting the communities. The human-caused and technological hazards section in the 2014 plan was broadened and pandemics and infectious diseases were added.
- An update to the critical facilities list and maps.
- An update to the assessment of vulnerabilities throughout the planning region.
- An update of the Hazus – MH reports for floods, earthquakes, and hurricanes.
- A reexamination of development trends and exposure to risks.
- A review and recommitment to the vision for disaster-resistant communities and support of the 2018 State goals for hazard mitigation.
- Identification and analysis of a comprehensive range of mitigation alternatives. Mitigation measures were added to the overall list of mitigation measures from the HMPC members' input. Through the evaluation of the status of the 2014 mitigation measures, the HMPC decided some measures were not applicable and they were removed.
- A reprioritization of mitigation actions and projects.

- Revised community action programs for each jurisdiction to better reflect the capabilities of the jurisdictions.

4.8 Opportunities for Public Comment on the Plan

The Hazard Mitigation Planning Committee (HMPC) requested and invited public input into and feedback on the mitigation plan in several ways including open meetings, the local news media, and an internet website: hazardmitigationplan.com. Each jurisdiction had a representative on the committee to bring forward resident input and concerns, as well. Residents were also invited to attend committee meetings in order to have the opportunity to present their comments and concerns. There was an email link available through the website for comments as well as access to the hazard assessment questionnaire. (Refer to Appendix H "Community Involvement Documentation" for further explanation and documentation.)

Due to Covid-19, no public presentations were made during the writing of the plan. The public could attend the meetings; however, only one individual not representing an area agency or jurisdiction attended the meetings and her input was invaluable, and many of her insights were incorporated into the plan. Her area of interest which is animal welfare led to multiple mitigation measures involving the care of animals during disasters. No other members of the public participated in the planning process, nor did they provide any feedback on the plan via the website.

Some jurisdictions conducted public hearings in their communities prior to the plan's submission to the AEMA. There was an additional hearing as required by State law for each jurisdiction prior to adopting this Plan by resolution. The original resolutions and public hearing minutes are kept on file at the Marshall County EMA offices.

Marshall County Multi-Hazard Mitigation Plan Update

CLICK HERE to go to the Citizen's Survey on Marshall County Hazards

The Marshall County Hazard Mitigation Planning Committee (HMPC) encourages all citizens, governmental agencies, school boards, colleges, universities, businesses, industries, utilities, and others within Marshall County and neighboring jurisdictions to participate in the 5-year update of the Multi-Hazard Mitigation Plan. Please review the information provided on this website and offer your recommendations and ideas on how we can make Marshall County and its jurisdictions safer communities. Please check back monthly throughout the planning process to see new or updated information.

What is the 2019 plan update?

The 2019 Marshall County Multi-Hazard Mitigation Plan is an update of the 2014 Marshall County Multi-Hazard Mitigation Plan. It is a multi-jurisdictional, multi-hazard mitigation plan for all communities that have participated in the preparation of the plan. The plan fulfills the requirements of the Federal Disaster Mitigation Act of 2000 (DMA 2000), as administered by the Alabama Emergency Management Agency (AEMA) and the Federal Emergency Management Agency (FEMA) Region IV.

The first plan for Marshall County was created in 2004 and there has been an update to the plan every five years. The participating jurisdictions in the development of this plan include the cities of Albertville, Arab, Boaz, and Guntersville, the towns of Grant, Douglas and Union Grove, and the boards of education for Marshall County, Albertville, Arab, Boaz, and Guntersville. The 2019 planning process will continue the unified approach among all Marshall County communities, and it will continue to guide Marshall County communities in their ongoing efforts to mitigate vulnerabilities.

The Marshall County Hazard Mitigation Planning Committee

The Hazard Mitigation Planning Committee meets regularly to oversee the drafting of the 2019 plan update. The various hazards that occur within Marshall County and their effects are discussed with suggestions on ways to mitigation their impacts. Funding sources to assist in mitigation measures are also presented. Committee members participate in planning exercises and other activities throughout the planning process. Representatives on the planning committee include commissioners, public works staff, emergency personnel, concerned citizens, school board personnel and others. All are welcome to attend; you do not have to be a member of the Committee.

HMPC Planning Schedule ~ All meetings are held at the EMA office located at 3550 Creek Path Road, Guntersville (Schedule is subject to change.) Due to COVID-19 the meeting schedule was changed.
Thursday, October 24, 2019 – 9:00 am
Friday, November 8, 2019 -10:00 am
Thursday, January 23, 2020 – 9:00 am
Thursday, February 20, 2020 - 9:00 am
Thursday, March 12, 2020 – 9:00 am
Thursday, April 16, 2020 – 9:00 am (Cancelled)
Thursday, May 14, 2020 – 9:00 am (Cancelled)
Thursday, June 11, 2020 – 9:00 am (also via Go-to-Meeting)
Thursday, July 9, 2020 - 9:00 am (also via Go-to-Meeting)
Thursday, August 20, 2020 - 9:00 am
Thursday, September 24, 2020 - 9:00 am
Public Meeting is to be determined

Draft Sections of the Plan

As the plan is in the drafting phase, the HMPC welcomes your comments and suggestions. Please take time to review each of the sections as they are drafted. The link below will link you to the chapter review webpage.

CLICK HERE to review chapters of the Marshall County Multi-Hazard Mitigation Plan

Chapter 5 – Risk Assessment

5.1 Summary of Plan Updates
5.2 Hazard Identification
5.3 Hazard Profiles
5.4 Vulnerability of Structures within Each Jurisdiction
5.5 Estimate of Dollar Losses to Vulnerable Structures
5.6 General Description of Land Uses and Development Trends
5.7 Repetitively-Damaged NFIP-Insured Structures
5.8 Summary of Hazards and Community Impacts
5.9 Risks that Vary Among the Jurisdictions

In accordance with the Risk Assessment requirements of 44 CFR Section 201.6 (c) (2), this chapter and the associated appendices provide the justification for the selection of hazards addressed in this plan update. The risk assessments for the hazards presented in this chapter identify the hazards that affect the jurisdictions within Marshall County and provide historical data on the impact the hazard has had on the jurisdiction. Vulnerability assessments are included in this chapter which analyze the jurisdiction's vulnerability to the hazards. This data is the basis for the mitigation strategy discussed in Chapter Six – "Mitigation Strategy".

5.1 Summary of Plan Updates

The 2020 Marshall County Multi-Hazard Mitigation Plan's Risk Assessment chapter has been redesigned to be easier to follow. An introductory paragraph has been added at the beginning of the chapter and at the beginning of each section. The order of sections has been modified, the category pandemic and infectious diseases has been added to the list of hazards, human-caused and technological hazards have been separated, and all data and maps have been updated. Most of the hazard occurrences mentioned in this section are within the 2015-2019 time period. Some noteworthy events prior to 2010 have been included in this chapter; however, most pre-2010 events have been moved to Appendix E "Marshall County Hazard Profile Data". Also, a summary paragraph is provided before each section on the critical facilities.

5.2 Hazard Identification

Not all hazards affect all the jurisdictions within Marshall County. Some hazards are determined by geology or location. When determining which hazards should be included in this plan update, various sources were consulted. The following sources were used for identifying hazards in Marshall County:

1. The 2014 Marshall County Multi-Hazard Mitigation Plan. Marshall County's 2014 plan identified the following hazards in Chapter 5 – Risk Assessment: tornadoes, severe storms, floods, winter storms/freezes, hurricanes, droughts/heat waves, wildfires, dam/levee failures, landslides,

earthquakes, sinkholes, and human-caused and technological hazards. Since the hazards still impact Marshall County, they were included in this plan update and the hazard "pandemic and infectious diseases" was added.

2. The Hazard Identification Worksheet. The HMPC members completed the Hazard Identification Worksheet for their jurisdiction. They provided their assessment on different factors in relation to each hazard. For natural hazards, the respondent recorded what percentage of the jurisdiction would be affected by the hazard, the probability of occurrence within a certain time frame, and the extent of the threat. For pandemic and infectious diseases, human-caused and technological hazards, the respondent recorded their degree of concern and how much of an impact the hazards have on the jurisdiction. Sections 5-8 and 5-9, and Appendix D, detail the analysis of the results.

3. List of Federally-Declared Disasters. A Presidential Major Disaster Declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, and designed to help disaster victims, businesses, and public entities. Declarations that have been issued that include Marshall County since 2000 are included in the following table. There were 7 declarations for severe storm/tornado damage that were due to direct impacts on the county. There was one where the hurricane directly impacted Marshall County and 2 declarations that helped with the costs associated with evacuations due to hurricanes along the coast.

Table 5-1. 2000-2020 Federal Disaster Declarations Affecting Marshall County

Disaster No.	Description	Date	Declaration Type
1317	Winter storm	02/18/2000	HM
1322	Severe storms, flooding	03/17/2000	HM
1352	Tornadoes	12/18/2000	HM
1362	Severe storms, flooding	03/05/2001	HM
1399	Severe storms, tornadoes	12/07/2001	IA,DH,IFG, SBA
1438	Tropical Storm Isidore	10/09/2002	HM
1442	Severe storms, tornadoes	11/14/2002	IA, DH, IFG, SBA
1466	Severe storms, tornadoes, flooding	05/12/2003	IA, PA-ABCDEFG, DH
1549	Hurricane Ivan	09/15/2004	IA, PA-ABCDEFG, HM
1593	Hurricane Dennis	07/10/2005	HM
1605	Hurricane Katrina	08/29/2005	HM
3237	Hurricane Katrina evacuation	09/10/2005	PA-AB, DFA
1687	Severe storms, tornadoes	03/03/2007	HM
3292	Hurricane Gustav	08/30/2008	PA-B
1789	Hurricane Gustav	09/10/2008	HM
1797	Hurricane Ike	09/26/2008	HM
1835	Severe storms, winds, flooding, tornadoes	04/28/2009	HM
1836	Severe storms, flooding, tornadoes, straight-line winds	05/08/2009	IA, PA-ABCDEFG, HM
1842	Severe storms, tornadoes, flooding, straight-line winds	06/03/2009	HM
1866	Tropical Storm Ida	12/22/2009	HM

Disaster No.	Description	Date	Declaration Type
1870	Severe storms, flooding	12/31/2009	HM
1908	Severe storms, tornadoes, straight-line winds, flooding	05/03/2010	IA, PA-ABCDEFG, HM
3319	Severe storms, tornadoes, straight-line winds	04/27/2011	PA-B, DFA
1971	Severe storms, tornadoes, straight-line winds, flooding	04/28/2011	IA, PA-ABCDEFG, DFA, HM
4052	Severe storms, tornadoes, straight-line winds, flooding	02/01/2012	HM
4082	Hurricane Isaac	09/21/2012	HM
4251	Severe storms, tornadoes, straight-line winds, flooding	01/22/2016	HM
3389	Hurricane Irma	09/11/2017	HM

Disaster Type Key	
IA – Individual assistance	A – Debris removal
PA – Public assistance	B – Protective measures
DH – Disaster housing	C – Roads and bridges
CC – Crisis counseling	D – Water control facilities
DFA – Direct federal assistance	E – Public buildings
DUA – Disaster unemployment assistance	F – Public utilities
HM – Hazard mitigation	G – Recreational
IFG – Individual and family grant	SA – Stafford Act
SBA – Small Business Administration	403C – Department of Defense

Source: FEMA, Region IV

4. The 2018 Alabama State Plan. The 2018 update of the State Plan served as an additional resource for identifying local hazards. The hazards identified by the State were compared against the list for the jurisdictions in Marshall County. The state plan includes some hazards that only affect the southern part of the state such as coastal flooding, storm surge, coastal land change, sea level rise and tsunamis. Since Marshall County is in the northern portion of the state, those hazards do not directly impact the county and therefore are not included. This update to the 2014 plan for Marshall County includes pandemic and infectious diseases, and human-caused and technological hazards which the state plan does not.

5. Other Hazard Identification Sources. Other sources for identifying hazards included the following resources:

   - Local knowledge and expertise of the Marshall County EMA Director and Operations Specialist;
   - Discussions with residents who served on the HMPC or participated in community events and surveys;
   - Local media accounts from the Arab Tribune and the Advertiser Gleam, among others which were thoroughly researched and assembled by the EMA staff;
   - Records of the National Weather Service and NOAA Storm Events Database; and
   - Extensive internet research.

Previous plans have included dollar amounts for damages, deaths, and injuries from the NCDC; however, due to the inaccuracy of that data, it is not included in this chapter. The raw data from the NCDC, including cost estimates, injuries, and deaths, is included in Appendix E– "Marshall County Hazard Profile Data".

5.3 Hazard Profiles

This plan update includes the same natural, human-caused, and technological hazards as those in the 2014 Marshall County Multi-Hazard Mitigation Plan with the addition of pandemic and infectious diseases. Many of the risks from hazards may be increased or decreased due to human activity. While this plan is the five-year update to the 2014 plan, the planning process occurred throughout 2020 during the COVID-19 Pandemic and the committee felt pandemic and infectious diseases should be addressed in this update. The hazards identified as impacting the Marshall County jurisdictions are listed in Table 5-2 "Identified Marshall County Hazards." This table of identified hazards notes multiple hazards that may be associated with, and/or caused by other hazard events. Sections 5.8 and 5.9 provide information about the variations in hazards threats and impacts by jurisdiction. In depth descriptions of the hazards presented in this chapter can be found in Appendix D "Marshall County Hazard Ratings and Descriptions".

Table 5-2. Identified Marshall County Hazards

Hazards	Associated Hazards	Jurisdictions Affected
Severe Storms	Thunderstorms Hail Lightning High Winds Tornadoes Floods Landslides Wildfires	All
Tornadoes	High Winds Severe Storms Lightning Hail	All
Flash Floods	Landslides	Unincorporated areas Albertville Arab Boaz Douglas Guntersville Union Grove

Hazards	Associated Hazards	Jurisdictions Affected
Riverine Floods	Landslides	Unincorporated areas Boaz Grant Guntersville
Hurricanes	Tropical Storms Tropical Depressions Severe Storms High Winds Floods Tornadoes	All
Winter Storms and Extreme Cold	Snowstorms Ice Storms Freezes	All
Extreme Heat	Drought Wildfires Heat Waves	All
Droughts	Wildfires Sinkholes Erosion Landslides	All
Wildfires	Landslides	Unincorporated areas Arab Boaz Douglas Grant Guntersville Union Grove
Earthquakes	Landslides Sinkholes Dam Failure	All
Landslides	Wildfires	Unincorporated areas Boaz Grant Guntersville Union Grove
Sinkholes		All

Hazards	Associated Hazards	Jurisdictions Affected
Dam and Levee Failures	Floods	Unincorporated areas Boaz Grant Guntersville Union Grove
Pandemic and Infectious Diseases		All
Human-Caused	Wildfires Sinkholes Landslides Floods Earthquake	All
Technological	Dam Failure	All

5.3.1 Severe Storms

According to the Hazard Mitigation Planning Committee severe storms are rated as the highest natural hazard threat to Marshall County communities. NOAA records confirm these public perceptions. Severe storms are common in Marshall County and can bring lightning, heavy rains, high winds, and hail. These storms are also responsible, on occasion, for tornadoes in the area. Between 2015 and 2019 Marshall County was impacted by a series of unique wind events. They fell into the following categories: pulse thunderstorms, microbursts, Gustnado and Derecho. Descriptions of these wind events can be found in Appendix D.

Location of Severe Storms

All areas of Marshall County have experienced frequent severe storms, including thunderstorms, straight-line winds, heavy precipitation, hail, and lightning and share equal risks for all degrees of severe storms throughout the year. The locations of these historical events are not mapped because they are too numerous and widespread.

Extent and Intensity of Potential Severe Storms

The extent of each storm event varies according to storm intensity and duration. Storm intensity is measured by the storm characteristics. Heavy or prolonged rain can cause flooding and lightning might start wildfires. Straight-line winds from the storms can cause damage to property or trees which can cause power and transportation disruptions. In some instances, these storms will spawn a tornado which can cause immense damage to property and infrastructure. All of the hazards that can accompany these severe storms can threaten property and are a danger to human safety as well.

Results of severe storms vary from thunderstorms that disrupt travel to extensive damage to utilities, structures, and infrastructure including washing out bridges and culverts. The extent of severe storms is not predictable due to the variation of intensity, duration, and other hazards involved.

Previous Occurrences of Severe Storms

According to National Climatic Data Center (NCDC) records, there have been 96 severe storms reported in Marshall County between 2010 and 2019. Marshall County can expect an average of 9.6 severe storm events per year.

Included in some of the severe storms between 2010 and 2019 were episodes of hail ranging in size from penny to golf ball. Based on the data from the NCDC, hail can be expected to occur in at least 2 severe storms per year. March 2017 had 3 separate hail events recorded on different days.

Lightning occurred in at least 13 severe storms in the 10-year span. Lightning has caused fires throughout Marshall County resulting in wildfires, damage to electronics, and structural damage over the last 5 years.

Thunderstorms and strong wind events occurred in 80 of the 96 severe storm events from 2010-2019. Four unique wind events affected Marshall County between 2015 and 2019. Those included a microburst in 2015, a gustnado in 2018, a pulse thunderstorm, and a derecho event known as the 2018 Southeastern Derecho.

Table 5-3 shows the number of each notable hazard event related to severe storms per year between 2010 and 2019.

Table 5-3. Severe Storms, 2010-2019

Year	Total Severe Storms	Hazards Included in Severe Storm		
		Hail	Lightning	Thunderstorm & Strong Wind
2010	13	3	2	11
2011	16	6	2	14
2012	7	3	0	6
2013	11	2	3	7
2014	11	1	0	10
2015	6	2	3*	5
2016	2	0	1*	3
2017	13	4	0	11
2018	13	3	0	10
2019	4	1	2*	3
Total	96	25	13	80
Annual Avg.	9.6	2.5	1.3	8

* Adjusted according to news accounts
Source: National Climatic Data Center 2020

Severe storms that impact Marshall County cause uprooting or damage to trees which often cause property damage, and utility and transportation disruptions. Outbuildings often sustain damage due to their lack of structural integrity. On September 23, 2017, three thousand people were without power due to a downed transmission line. Trees were on powerlines throughout the county due to saturated ground. Hail and a flash flood also occurred with this event. In March 2019, runoff from a rain event caused a 20-foot ravine to form off Swinging Bridge Road.

On April 14, 2018, a narrow path of wind damage was surveyed at the Little Mountain Marina northeast of Guntersville. Minor damage was reported to marina buildings and multiple trees were damaged. The NCDC report states, "The final damage of note occurred near Murphy Hill Road, where two isolated pine trees were snapped in a larger grove of pine trees. Witnesses reported seeing a waterspout without water form over Lake Guntersville and move ashore, causing the damage. Another witness noted that the waterspout formed along the cold front." The National Weather Service determined that the "waterspout" was actually a gustnado.

Probability of Future Severe Storm Events

Frequent annual severe storms are guaranteed to occur in the future. Past trends show annual occurrences of thunderstorms that bring hail and lightning will continue to occur throughout all Marshall County jurisdictions. High winds and thunderstorms occur with approximately 80% of the severe storms, while events with large damaging hail and severe lightning is rare. Regarding the impact of climate change on severe storms, the National Climatic Data Center attributes the increase of frequency of thunderstorms, in part, to human-induced atmospheric changes.

While the residents of Marshall County cannot keep severe storms from occurring, they can work to lessen the impact of such events. By increasing public awareness about mitigation measures they can take, less property damage and better protected lives should result. Chapter Six – "Mitigation Strategy" addresses different mitigation measures that can be undertaken to lessen the impact of severe storms.

5.3.2 Tornadoes

Along with severe storms, the members of the hazard mitigation planning committee considered tornadoes as one of the greatest weather threats to the Marshall County communities. This evaluation is based on hazard exposure, the intensity of the risk, and the probability of future occurrence.

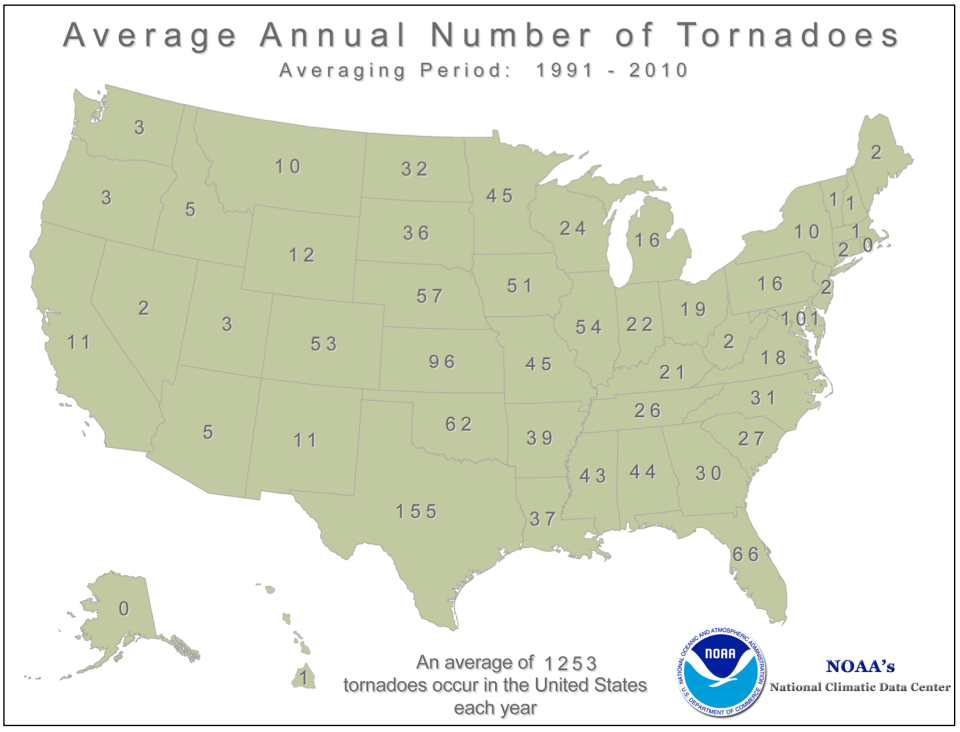
According to NOAA's National Climatic Data Center, there are an average of 1,253 tornadoes per year in the United States. The NCDC looked at the years 1991-2010 to arrive at that average. During that same time period, NCDC determined that Alabama averages 44 tornadoes a year. Of the 44 tornadoes, 1.7 are rated as EF-3 to EF-5. Tornado strength is indicated by the Enhanced Fujita Scale, which is shown in Table 5-4. Map 5-1 shows the average number of tornadoes in the United States between 1991 and 2010.

Table 5-4. EF-Scale Explanation

EF-Scale	Typical Damage
EF-0 (65-85 MPH)	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF-1 (86-110 MPH)	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF-2 (111-135 MPH)	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF-3 (136-165 MPH)	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF-4 (166-200 MPH)	Devastating damage. Whole frame houses Well-constructed houses and whole frame houses completely leveled; cars thrown, and small missiles generated.
EF-5 (>200 MPH)	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd.); high-rise buildings have significant structural deformation; incredible phenomena will occur.
EF (NO RATING)	Inconceivable damage. Should a tornado with the maximum wind speed in excess of EF-5 occur, the extent and types of damage may not be conceived. A number of missiles such as iceboxes, water heaters, storage tanks, automobiles, etc. will create serious secondary damage to structures.

Source: NOAA, Storm Prediction Center, 2014

Map 5-1. Average Number of Tornadoes in US, 1991-2010



Tornadoes can occur anytime of the year; however, as can be seen in Chart 5-1, most tornadoes that impact Alabama occur in the spring, with an uptick again in November. The month of April is the most active month for tornadic activity. Chart 5-2 shows that tornadoes traveling through Dixie Alley tend to hit between 2 PM and 8 PM with the most activity around 4 PM.

Chart 5-1. Tornadoes by Month in Alabama, 1950-2019

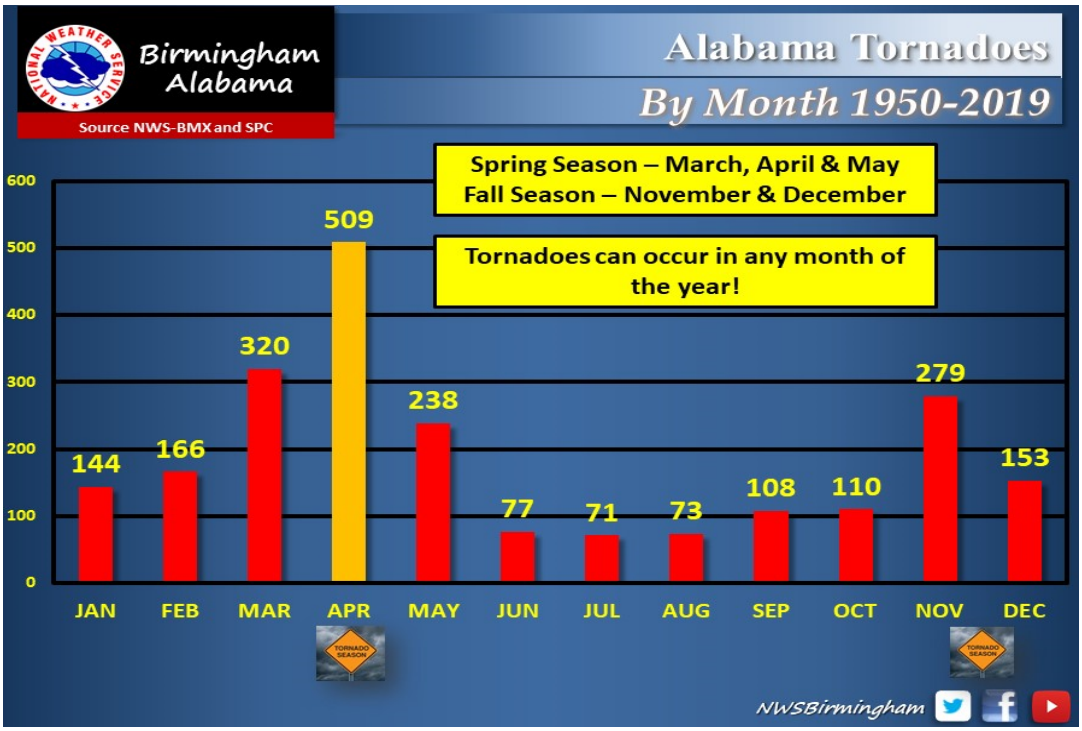
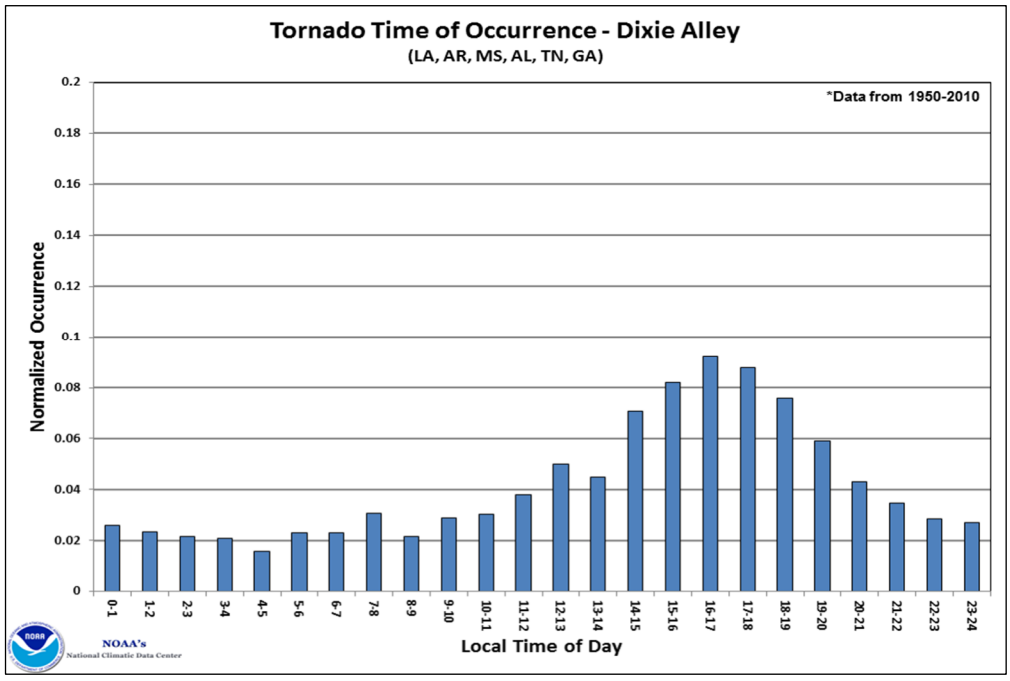


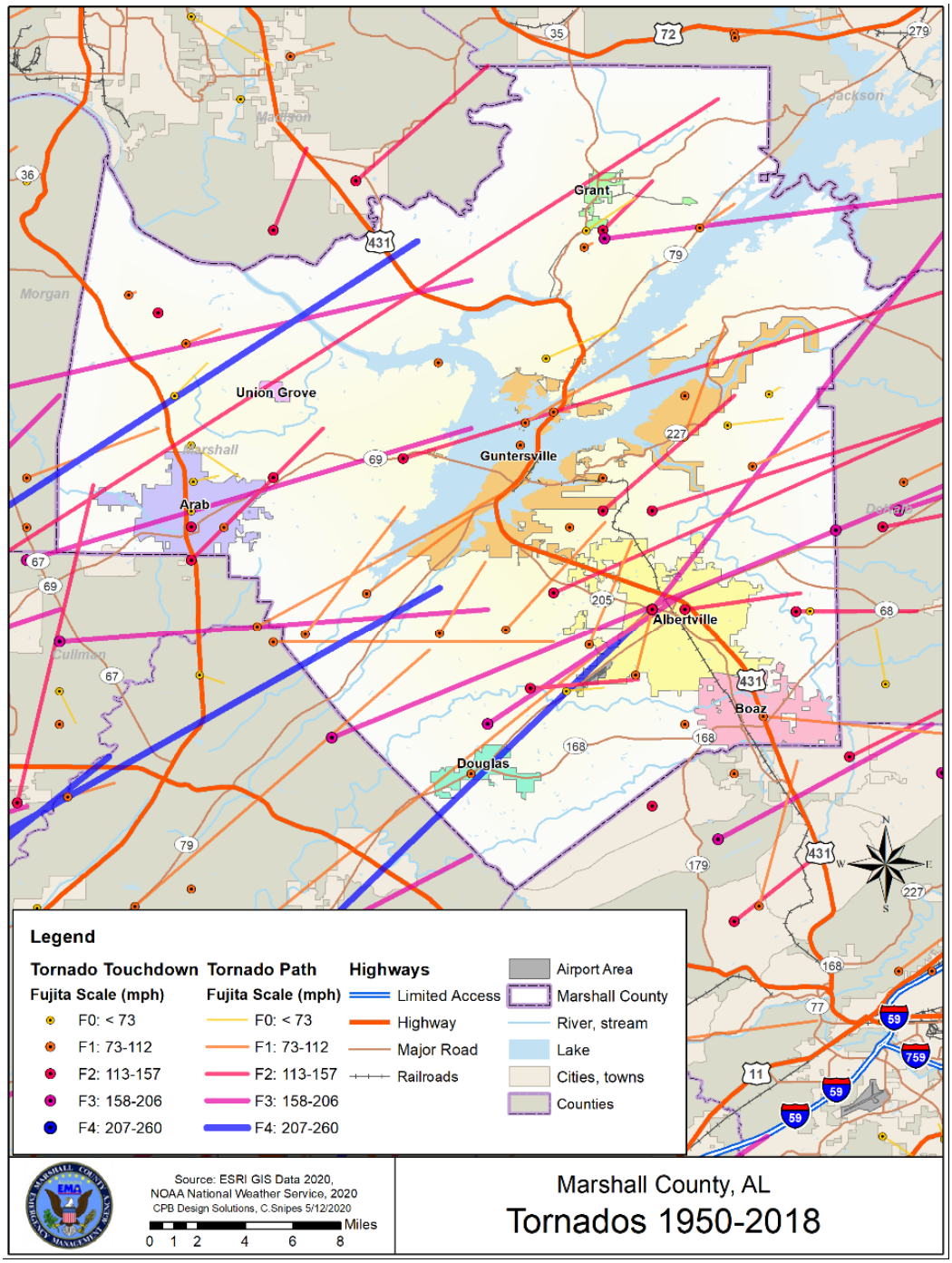
Chart 5-2. Time of Occurrence for Tornadoes in Dixie Alley, 1950-2010



Location of Potential Tornadoes

The risk of being affected by a tornado touchdown is equal for all areas of Marshall County. Map 5-2 shows touchdown points and paths of tornadoes that have occurred since 1950. Tornadoes have been present all throughout the county and most often travel from the southwest, heading northeast out of the county. The southeast corner of the county has seen the most tornadic activity over the last 70 years with Albertville being the city with the most recorded events.

Map 5-2. Marshall County Tornadoes, 1950-2018



Extent and Intensity of Potential Tornadoes

Between 2010 and 2019 there were 11 dates with tornadic activity, all which resulted in property damage. There were a total of 24 recorded tornadoes during that time period including 14 that occurred on April 27, 2011. Event records agree with the HMPC's assessment that tornadoes are one of the greatest threats to Marshall County in terms of damage to life and property. Tornadoes are often a by-product of severe storms or hurricanes. Table 5-5 breaks out the date, magnitude, and number of direct deaths and injuries that occurred between 2010 and 2019 due to tornadoes. Previous plans have included dollar amounts for damages; however, due to the inaccuracy of that data, it is not included in this table. Numbers of direct injuries and deaths have been verified and are included. The raw data from the NCDC including dollar values is presented in Appendix E.

Table 5-5. Annual Summary of Tornado Events, 2010-2019

BEGIN DATE	MAGNITUDE OF TORNADO (EF-SCALE)	DEATHS DIRECT	INJURIES DIRECT
04/24/2010	EF3	0	35
10/25/2010	EF0	0	0
10/26/2010	EF0	0	0
04/27/2011	EF0 -EF4 (*)	6	48
03/18/2013	EF0-EF1 (+)	0	0
10/03/2014	EF0	0	0
11/29/2016	EF1	0	0
08/31/2017	EF1	0	0
03/19/2018	EF2	0	0
04/08/2019	EF1	0	1
05/09/2019	EF1	0	0
TOTAL		6	83
* Denotes multiple tornadoes (14) + Denotes intensity variation as it traveled.			

Source: National Weather Service

Marshall County averaged 1 tornado per year over the last ten years when you remove the outlier of 14 tornadoes in April 2011. Most tornadoes during that time period were EF-0 to EF-1 with some reaching a level of EF-4. There is no pattern of intensity by location within the county as any magnitude tornado can occur in any location.

Previous Occurrences of Tornadoes

Three major tornado events impacting Marshall County occurred outside of the 2015-2019 period. One of the deadliest tornadic events to affect Marshall County occurred on February 16, 1995. Five people were killed in Marshall County and 130 were injured along the tornado's 14-mile path through Marshall and Cullman counties when a tornado ripped through Joppa and Arab just after 5:00 Thursday morning. Unfortunately, there was no warning of the approaching tornado as a lightning

strike had knocked out the weather transmitter in Huntsville shortly before the warning was issued by the National Weather Service. Among those killed was a four-year-old girl. Eighty homes and 6 businesses were destroyed as a result of this tornado.

In Albertville on April 24, 2010, an F-3 tornado touched down around 10 pm and injured 33 people, doing major damage to many structures throughout the city. Albertville High School's roof and football stadium were badly damaged. One house was lifted off its concrete foundation before being dropped by the tornado. The biggest issues were caused by the trees knocked down by the tornado. They were strewn across roads, on top of cars and homes, as well as on top of many powerlines.



On April 27, 2011, a "Super Outbreak" of approximately 62 tornadoes, including 3 that were measured as F-5 strength, swept through the state of Alabama, killing 247 people and injuring thousands. Fourteen of the tornadoes that hit on April 27th touched down in Marshall County during the three waves of tornadoes occurring that day. Six people died in Marshall County (5 of whom belonged to the same family) and 48 were injured. These tornadoes did millions of dollars in damage to homes, businesses, schools, and vital parts of the infrastructure such as power lines and roads. Map 5-3 shows the tracks of the tornado paths on April 27.

More recently an EF2 tornado hit the Horton/Douglas area on March 19, 2018. Five mobile homes were destroyed, two others sustained minor damage. Forty-eight houses were impacted with many barns and chicken houses either damaged or destroyed.



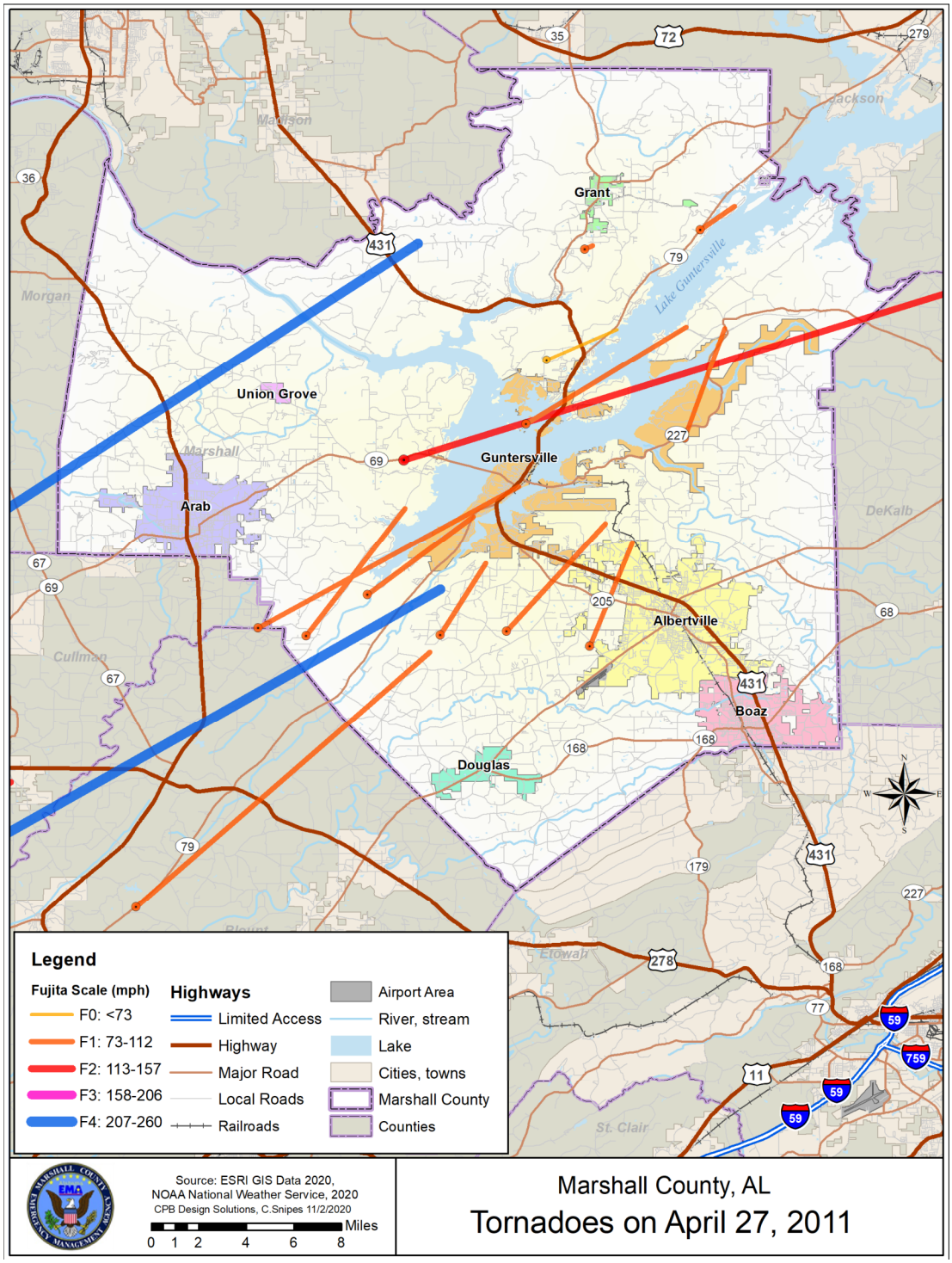
On April 8, 2019, an EF-1 tornado with peak wind speeds of 100 mph and a 6.5-mile track moved through Marshall County. The tornado caused trees to snap and others to be uprooted which resulted in power line damage. There was roof damage to homes and a large shed was demolished. There were 3 people injured as a result of the tornado but no deaths.





Fox News

Map 5-3. Tracks of the Tornadoes' Paths in Alabama on April 27, 2011



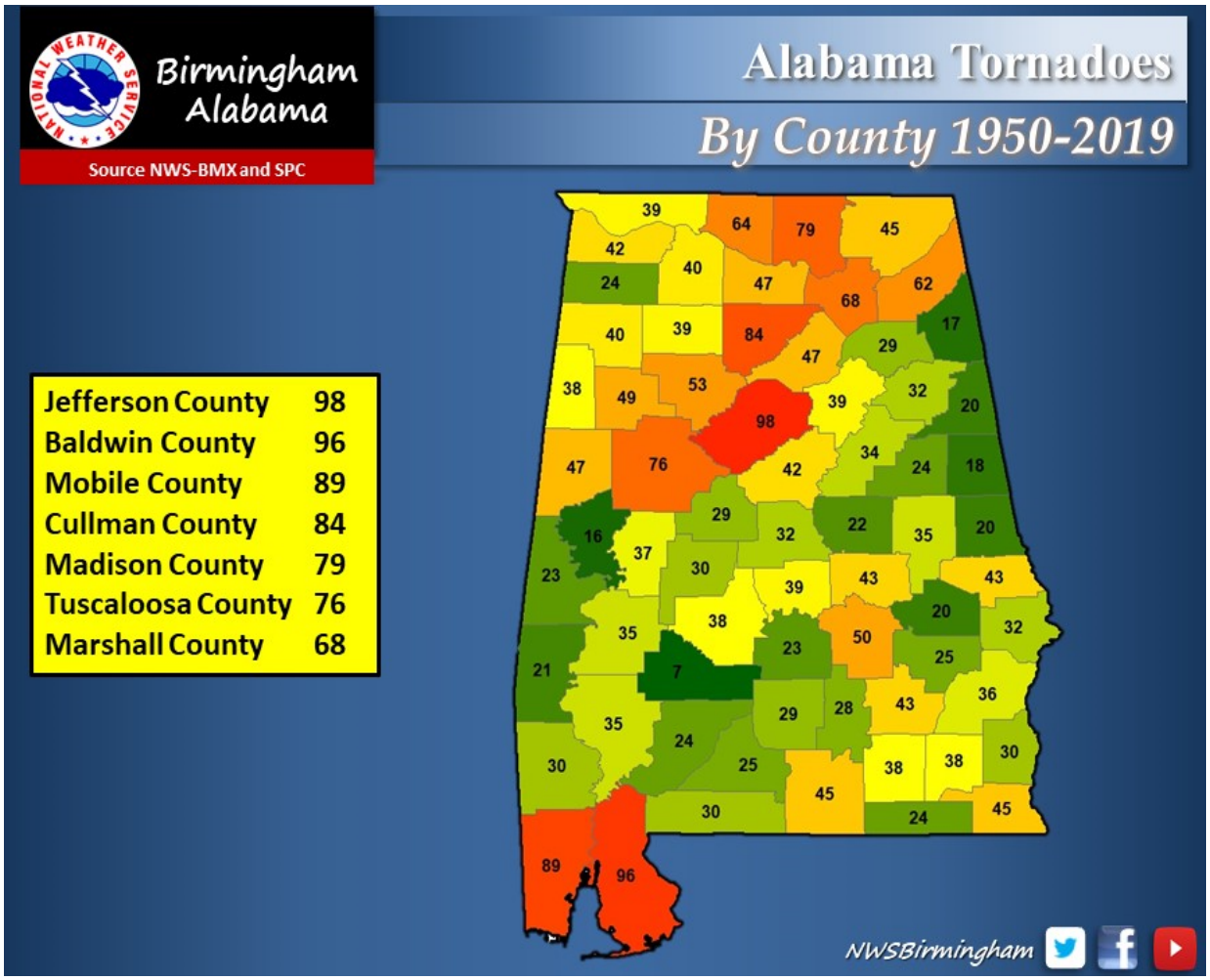
Probability of Future Tornado Events

According to the Alabama State Plan, Marshall County ranked 22nd when ranking the counties according to property damage caused by tornadoes between 1950 and 2017. While tornadoes are known to be unpredictable in location, frequency, and intensity, it is more likely than not, based on

past trends, that Marshall County will experience tornadic activity at some point each year. Springtime is the most likely time for tornadic activity followed by a historical spike in November. There have been discussions in meteorological circles that climate change may result in future increases of tornado events in the southeast but because tornadoes happen so quickly and are difficult to predict, it cannot be known for sure.

Based on historical data, Marshall County can anticipate continued annual tornadic events causing frequent damage, sometimes severe. Map 5-4 shows that Marshall County has the 7th highest number of recorded tornadoes in Alabama.

Map 5-4. Alabama Tornadoes by County, 1950-2019



As with severe storms, public awareness about preparation for tornadic events and preparation of shelters and dependable warning systems are necessary to decrease the effects of these types of hazards. More information about mitigation measures that can be enacted to lessen the impact of tornadoes can be found in Chapter Six – "Mitigation Strategy".

5.3.3 Floods

Flooding in Marshall County involves either flash floods or riverine floods. Flash floods are instances where heavy rainfall over-saturates the ground and overwhelms drainage infrastructure meant to carry rainwater away. This type of flood comes on quickly, often in less than 6 hours, and the waters have the ability to move very fast which can be dangerous. Flash floods may occur in any location at any time of year and can cause damage to roads, property, and even injury or death. Records show that occasional storm bursts exceeding four inches of rain in a short period of time have forced evacuations of homes, road and bridge closings, damage to vehicles, and flooding of buildings.

Riverine flooding usually occurs when very intense or prolonged rainfall causes the waterways of the county to exceed their capacity. It can also be caused by the failure of a dam or levee, a hazard which is discussed in Section 5.3.12 of this plan. Most of Marshall County's waterways flow through a system of tributaries and drainage ways to Lake Guntersville and the Tennessee River. The Guntersville Dam on the Tennessee River is a control for Lake Guntersville's capacity and is effective in preventing damages from major rainfall events. During times of possible inundation, TVA performs controlled release of water to keep from flooding areas down from the dam.

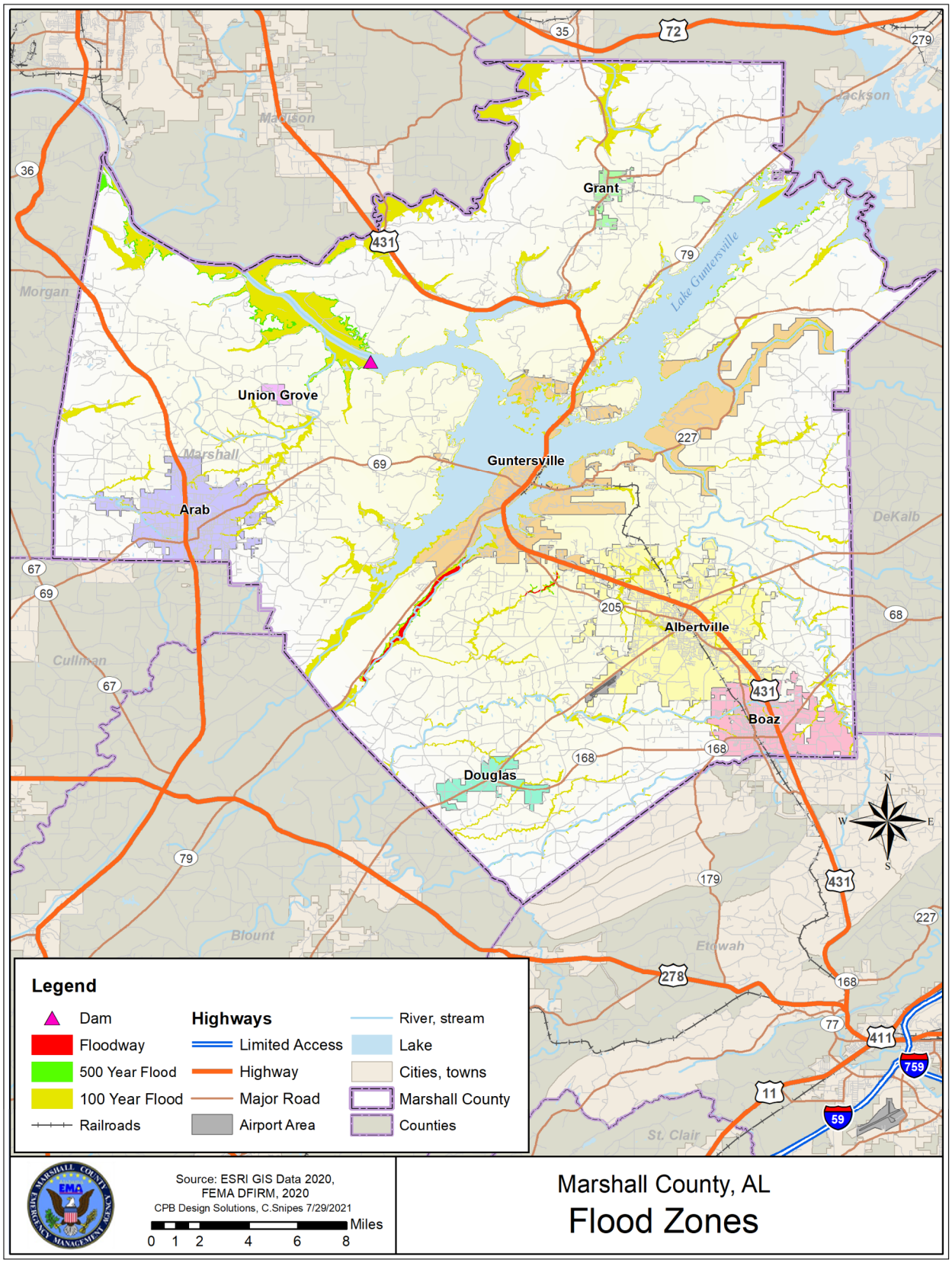
Riverine flooding generally results in diminished boat and barge traffic on the waterways and can impact the tourism aspect of areas around Lake Guntersville by limiting water activities and saturating campgrounds. A more severe flooding incident could result in property damage and possibly loss of life.

Location of Potential Floods

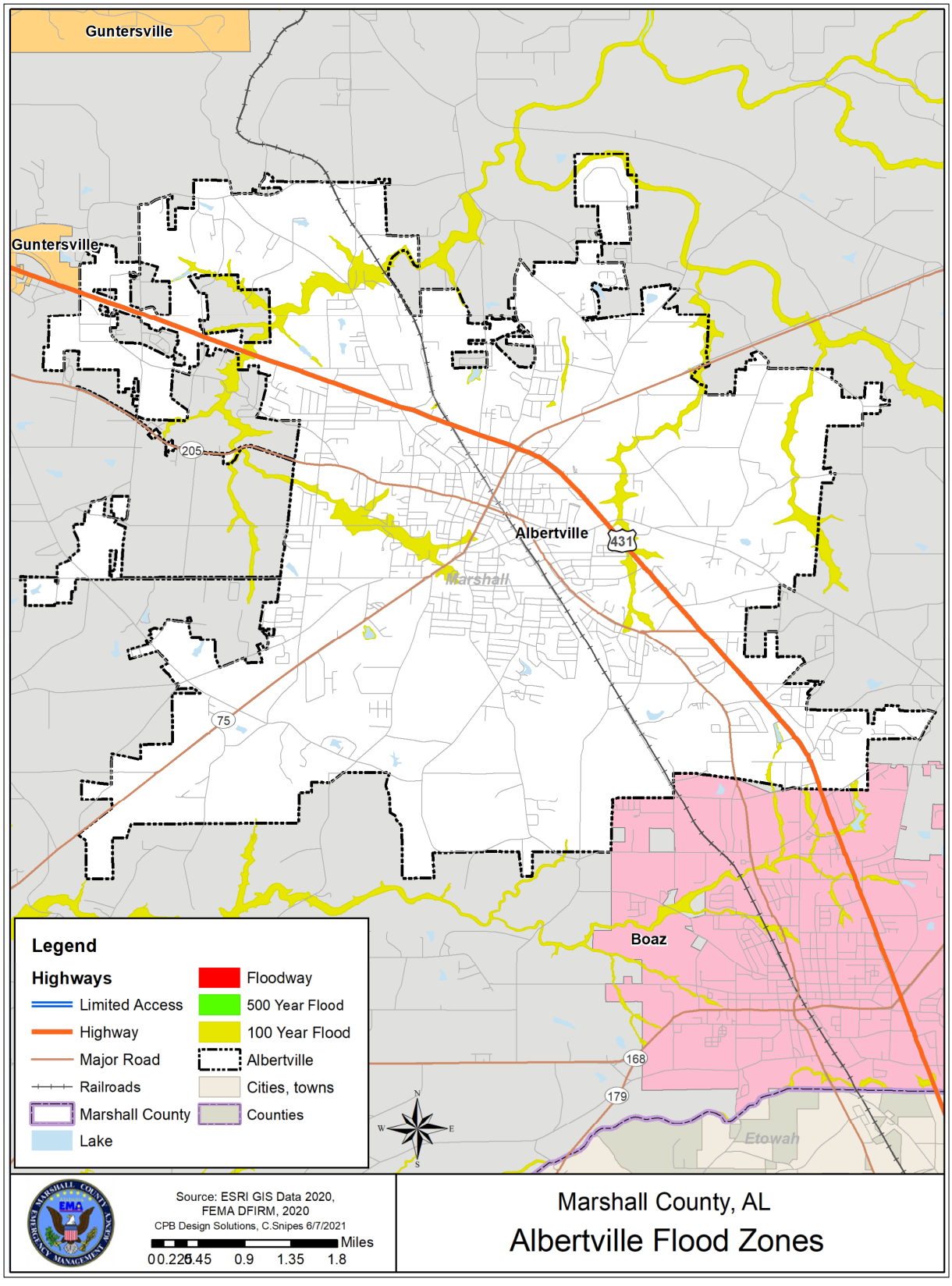
Flash floods are not limited to or restricted by low lying areas or areas that are considered floodplains; they are common and occur equally throughout the county when rain falls too quickly to be absorbed by the ground and overwhelms storm drainage systems. Impervious surfaces and saturated areas increase the possibility of flash flood events as does poorly maintained drainage systems.

According to the Flood Insurance Rate Maps (FIRMs) of the National Flood Insurance Program (NFIP), Marshall County does not have extensive flood plains. Map 5-5 "Marshall County Flood Zones" shows most extensive flood zones are primarily confined to rural locations below Guntersville Dam, on the Tennessee River, along the northern county limit, and southwest of Lake Guntersville, where property damages from a 100-year flood would be minimal due to low population density. Maps 5-6 through 5-12 show the flood zones for the cities of Albertville, Arab, Boaz, and Guntersville and the towns of Douglas and Grant. The town of Union Grove does not have any special flood hazard areas mapped within their municipal boundaries. The only floodway indicated on the FIRMs is located in the southwestern portion of Guntersville and it extends in southwesterly direction into the county along Big Spring Creek. As can be seen on Map 5-5 and according to the FIRMs, 500-year flood zones do not occur in any incorporated areas of Marshall County other than a sliver in the northwest and the southwest corners of Guntersville along Lake Guntersville.

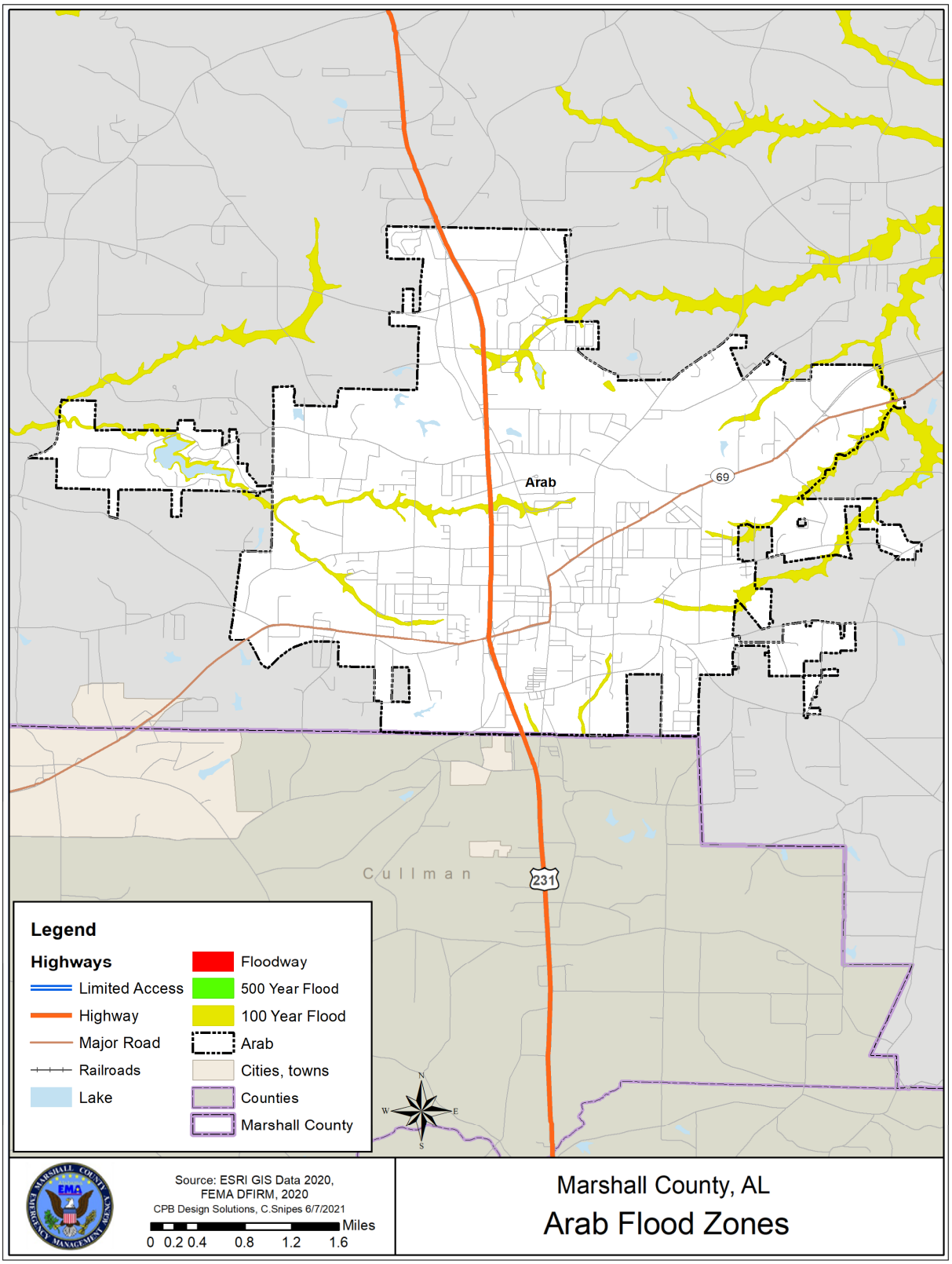
Map 5-5. Marshall County Flood Zones



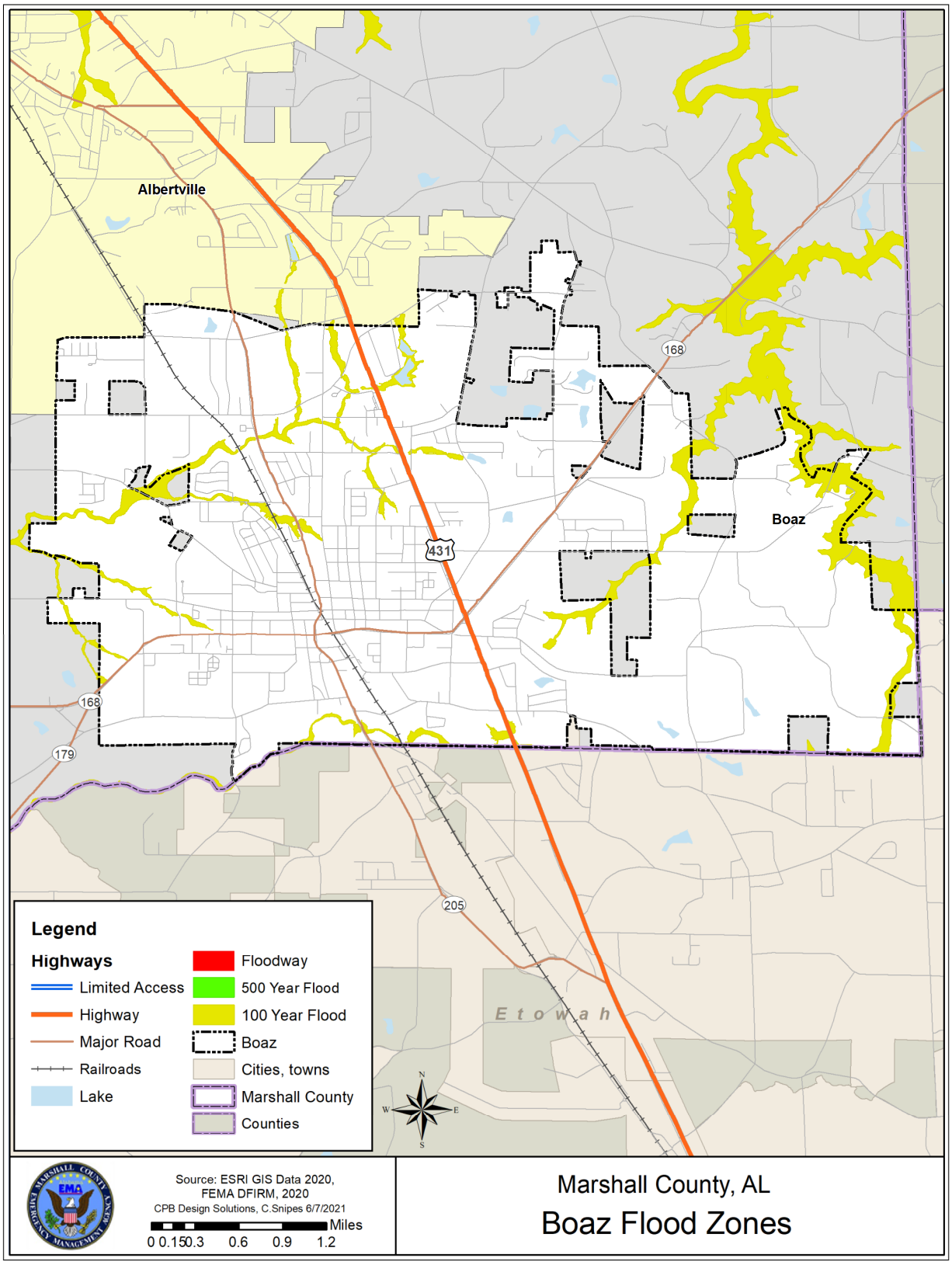
Map 5-6. City of Albertville Flood Zones



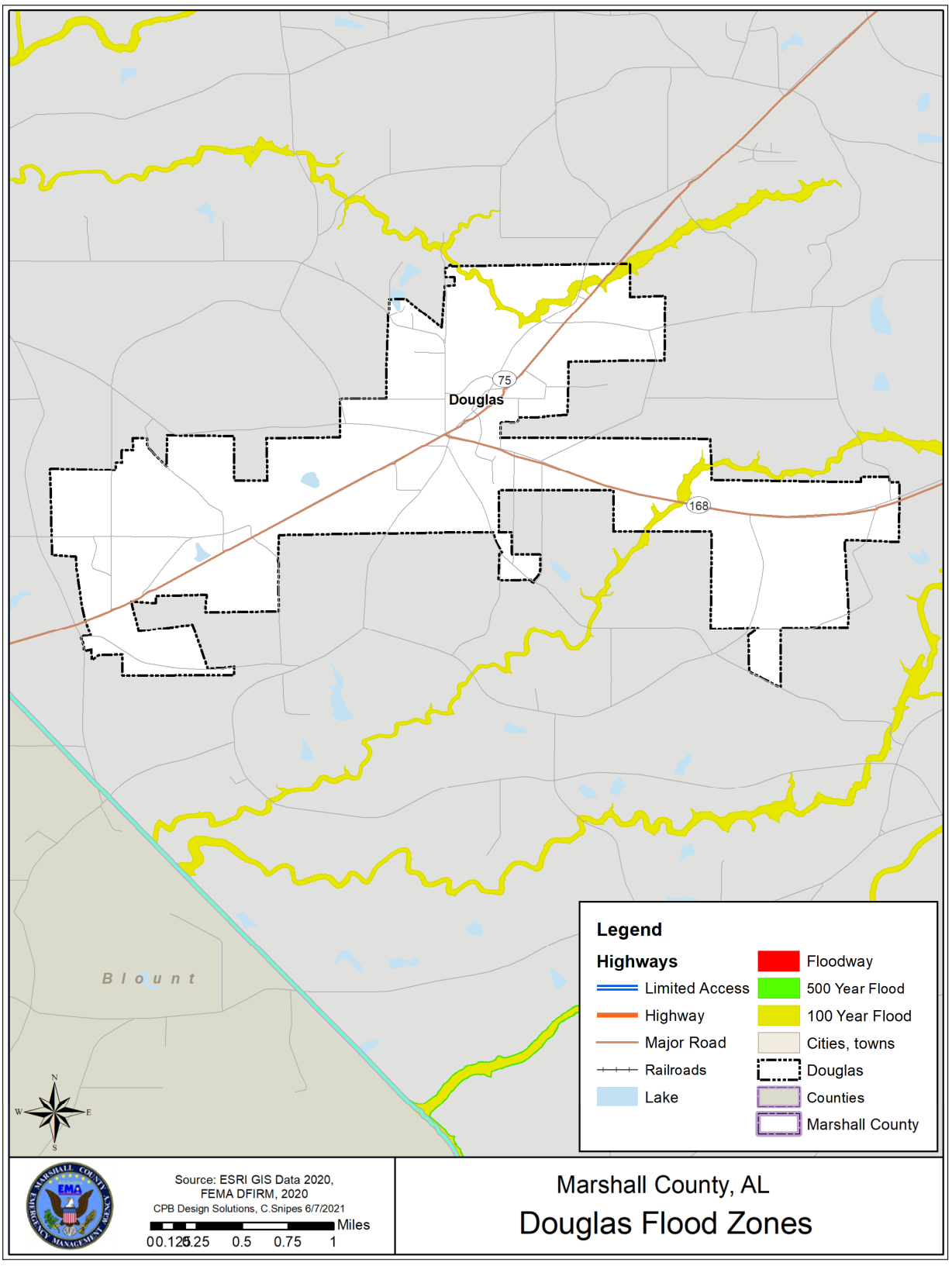
Map 5-7. City of Arab Flood Zones



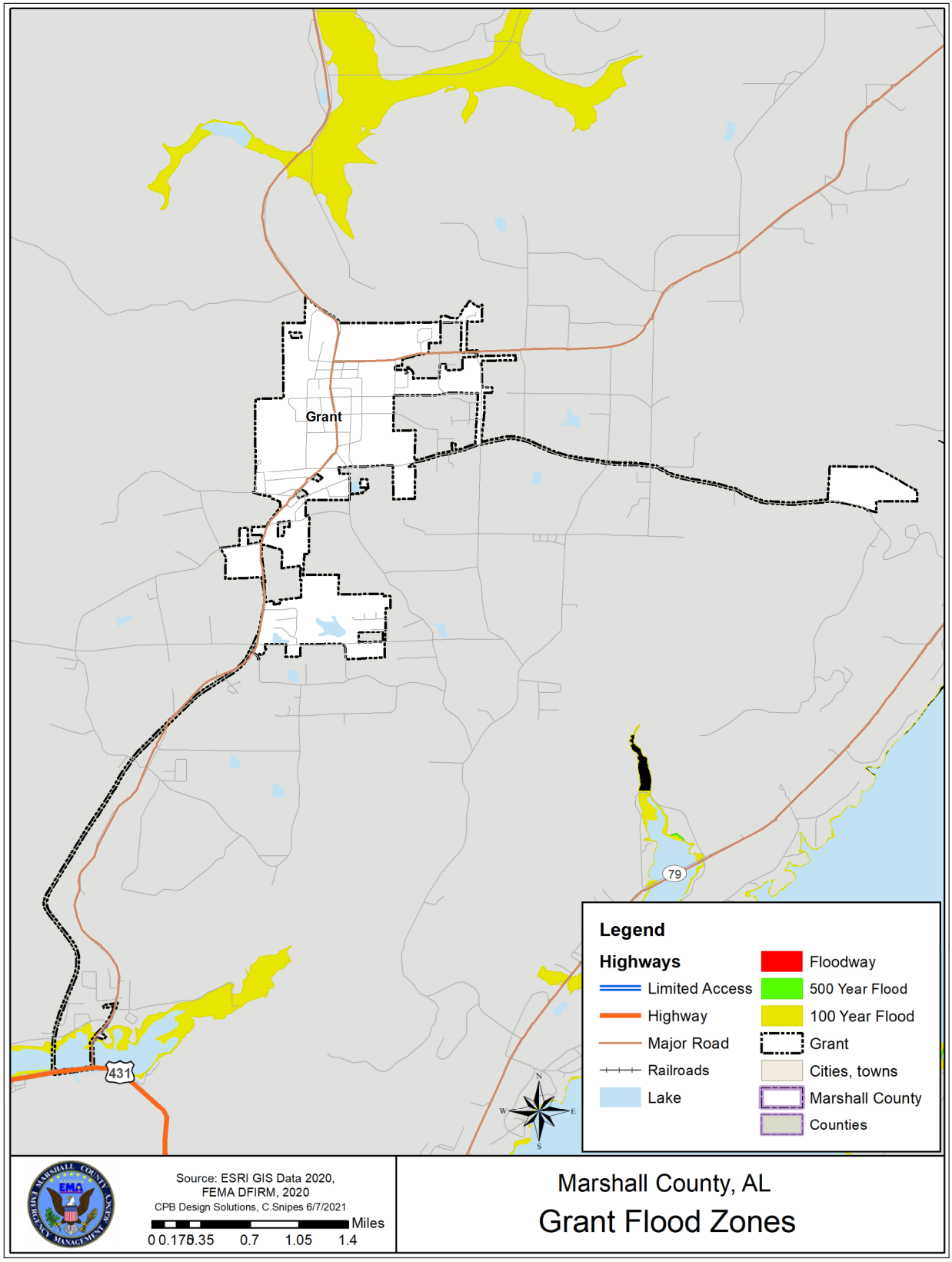
Map 5-8. City of Boaz Flood Zones



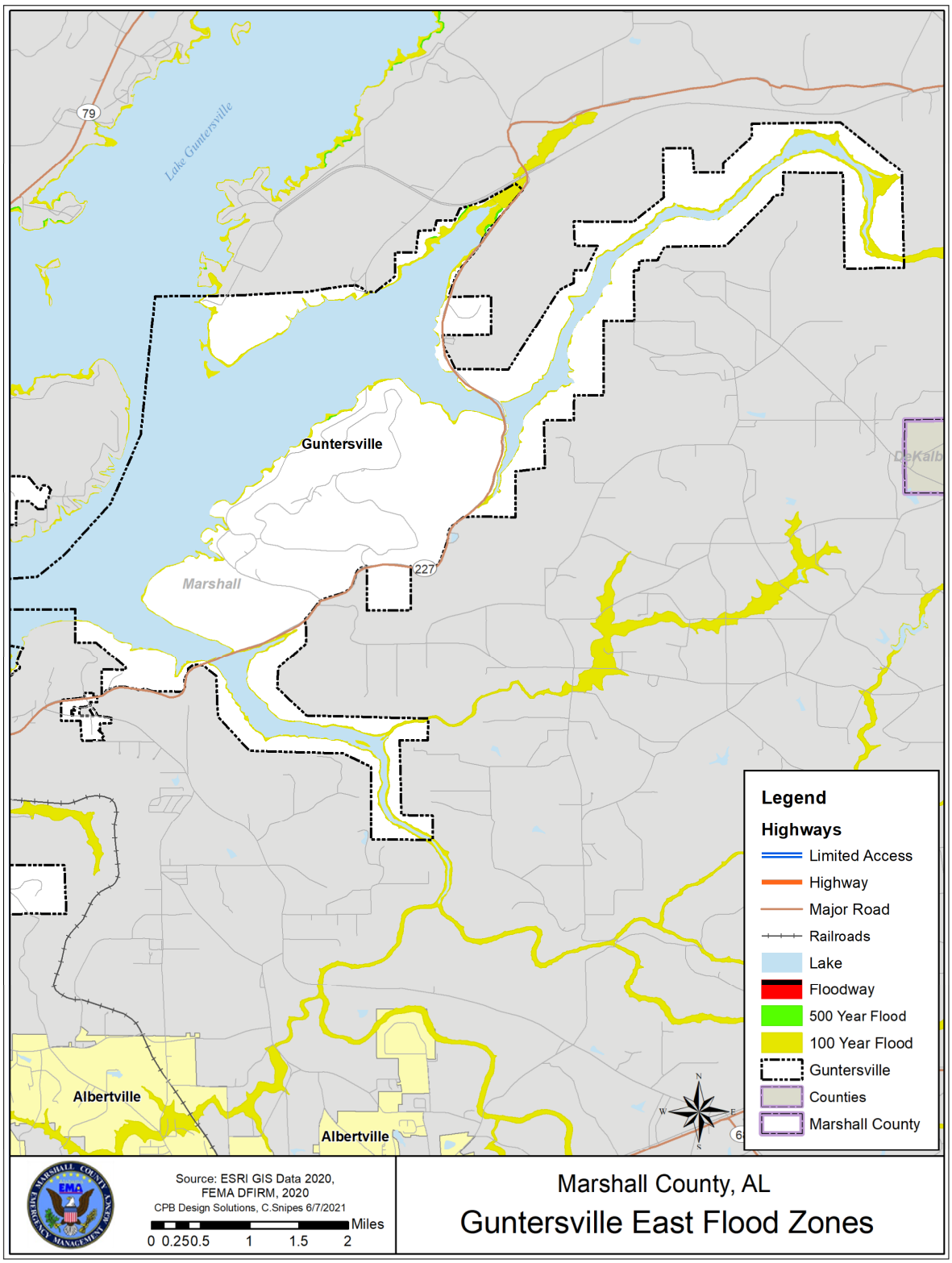
Map 5-9. Town of Douglas Flood Zones



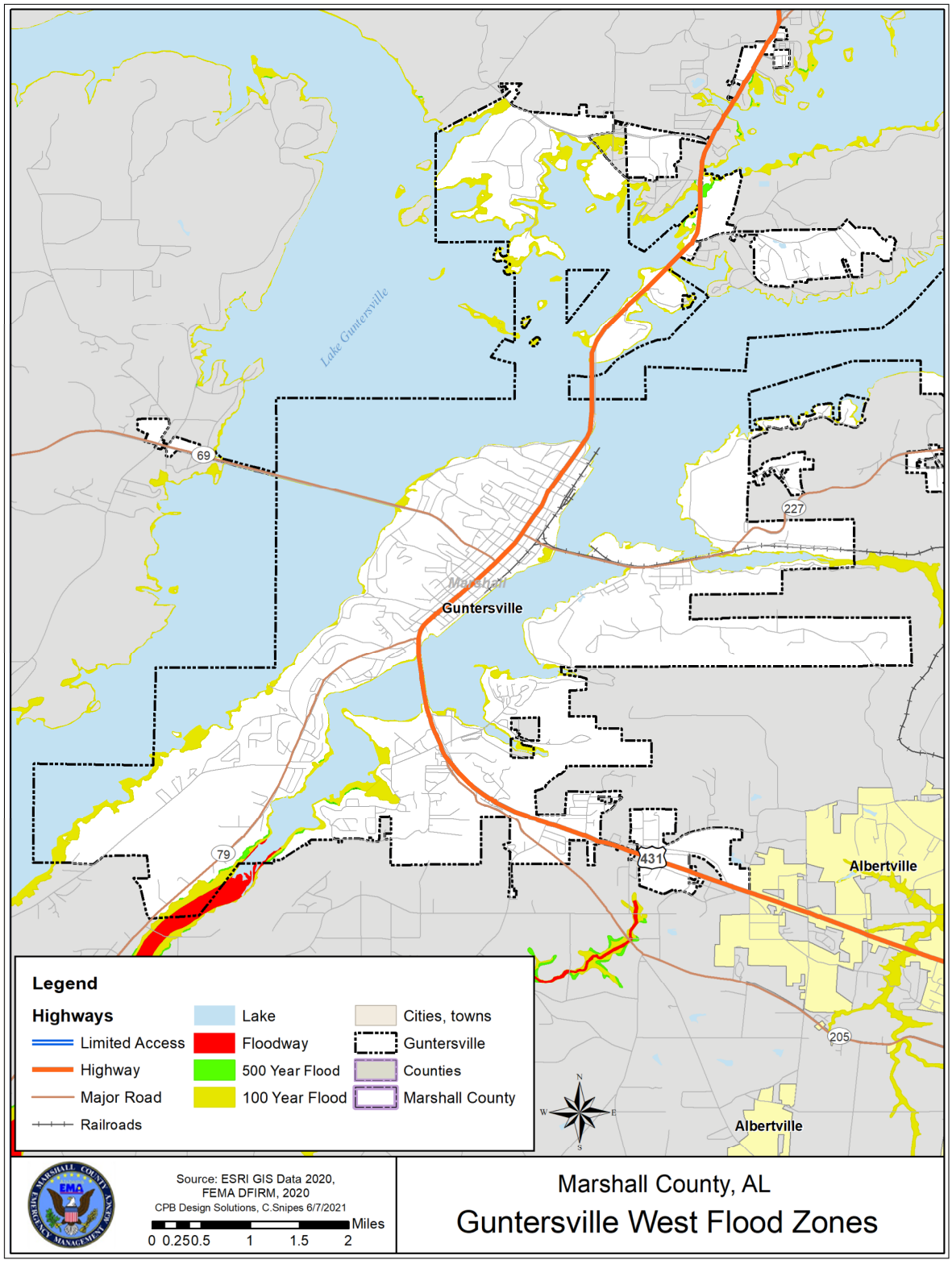
Map 5-10. Town of Grant Flood Zones



Map 5-11. City of Guntersville East Flood Zones

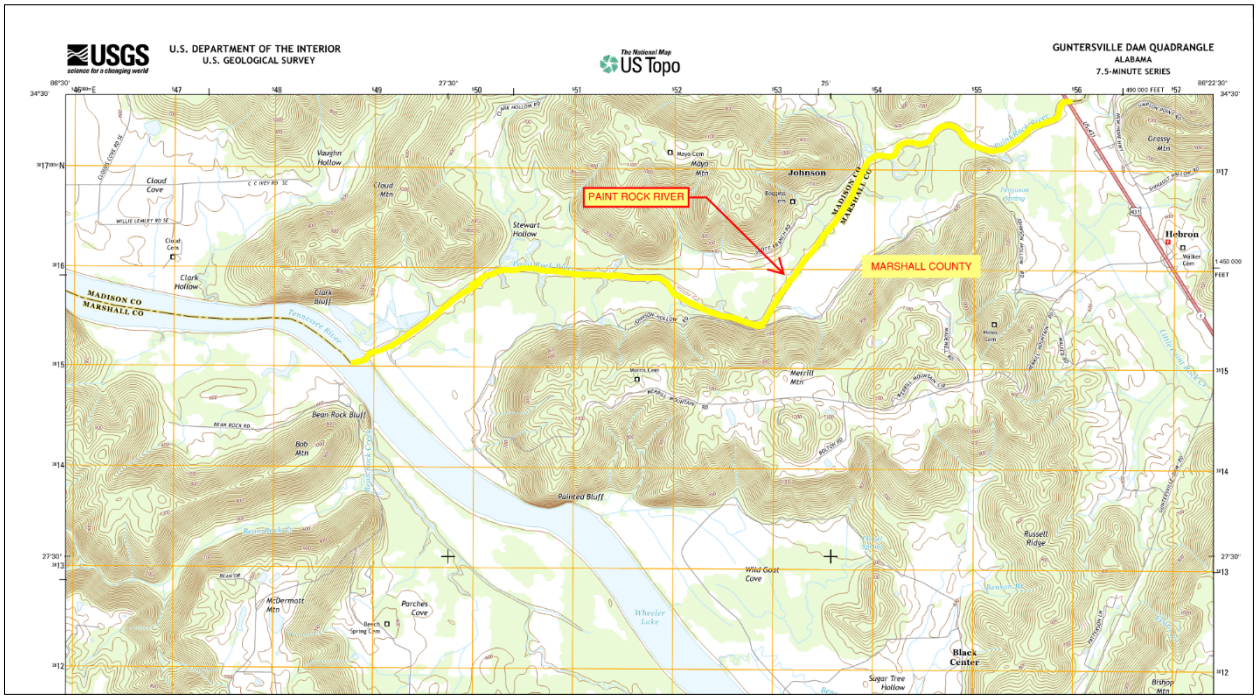


Map 5-12. City of Guntersville West Flood Zones



While the most likely and most dangerous riverine flooding would occur near the larger waterways of the Tennessee River and below Guntersville Dam, less impactful flooding is also possible along the county's 98 creeks and streams located throughout the county. Most riverine related floods in Marshall County occur due to flooding along Paint Rock River. Paint Rock River forms part of the western border between Marshall and Madison Counties. In 2015, 2017, 2019 and 2020 the river was reported to have crested at 17 feet. Although there is consistent flooding along portions of Paint Rock River affecting the residents along Butler Mill Road in north Marshall County, they are unwilling to relocate. Map 5-13 shows the location of Paint Rock River.

Map 5-13. Paint Rock River



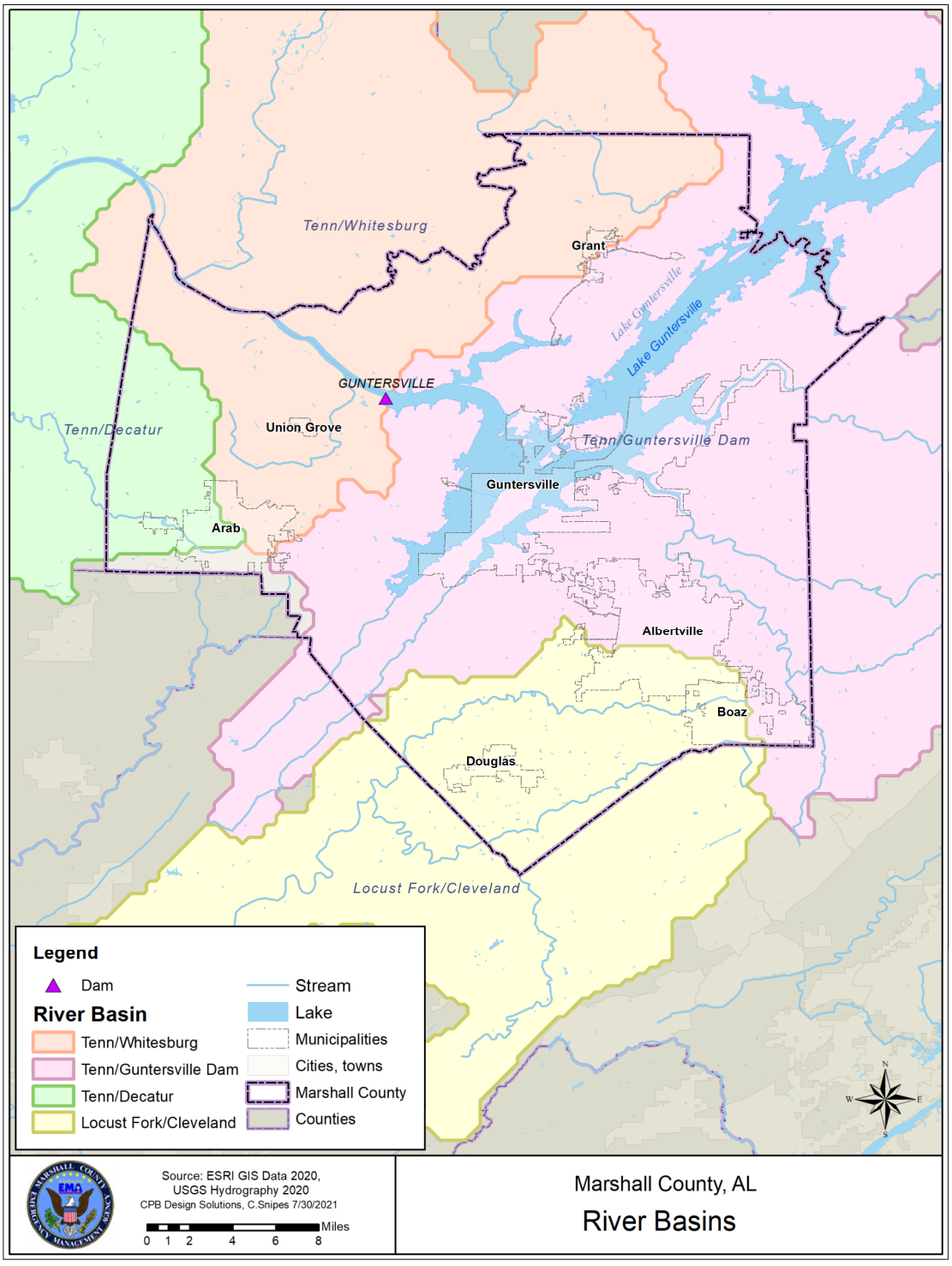
Extent and Intensity of Potential Floods

There are four river basins that impact Marshall County. They are the Tennessee/Whitesburg River Basin, Tennessee/Guntersville Dam River Basin, the Tennessee/Decatur River Basin, and the Locust Fork/Cleveland River Basin. The rivers and tributaries throughout the county drain into one of these four basins. Map 5-14 shows the Marshall County with the 4 basins delineated. There are four main flooding sources in Marshall County as indicated in the Flood Insurance Study of 2019. They are Big Spring Creek, Hog Creek, Locust Fork of Black Warrior River, and the Tennessee River. The flood depths for these flooding sources along with other tributaries per HAZUS are included on Maps 5-15 through 5-25. The maps also show which basin is impacted by the different waterways.

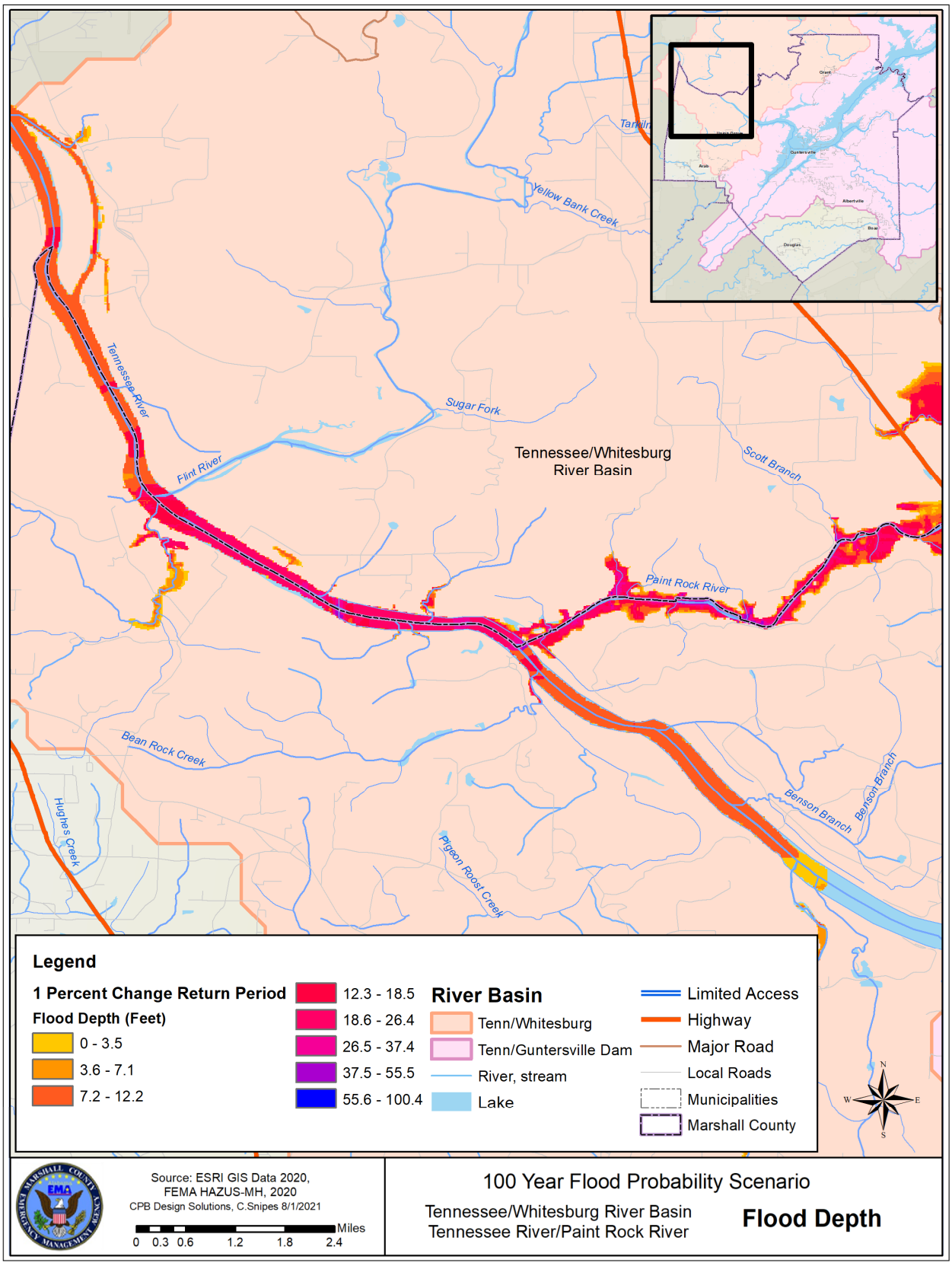
The extent of flooding in Marshall County varies according to the amount of rainfall, the rate of storm water flow, and the capacity of the receiving channel to discharge flood waters. The operation of the Guntersville Dam to control the surge of flood waters caused by heavy rains ensures that riverine flooding has a low impact on Marshall County. Waterway traffic is restricted while the Guntersville

Dam moves large quantities of water in order to ensure the safety of residents and visitors, but the excess water rarely affects the land outside of the banks of the major waterways. Paint Rock River, Little Paint Creek, Big Spring Creek, and Slab Creek have areas that the water exceeds the banks of their waterway as shown on the maps.

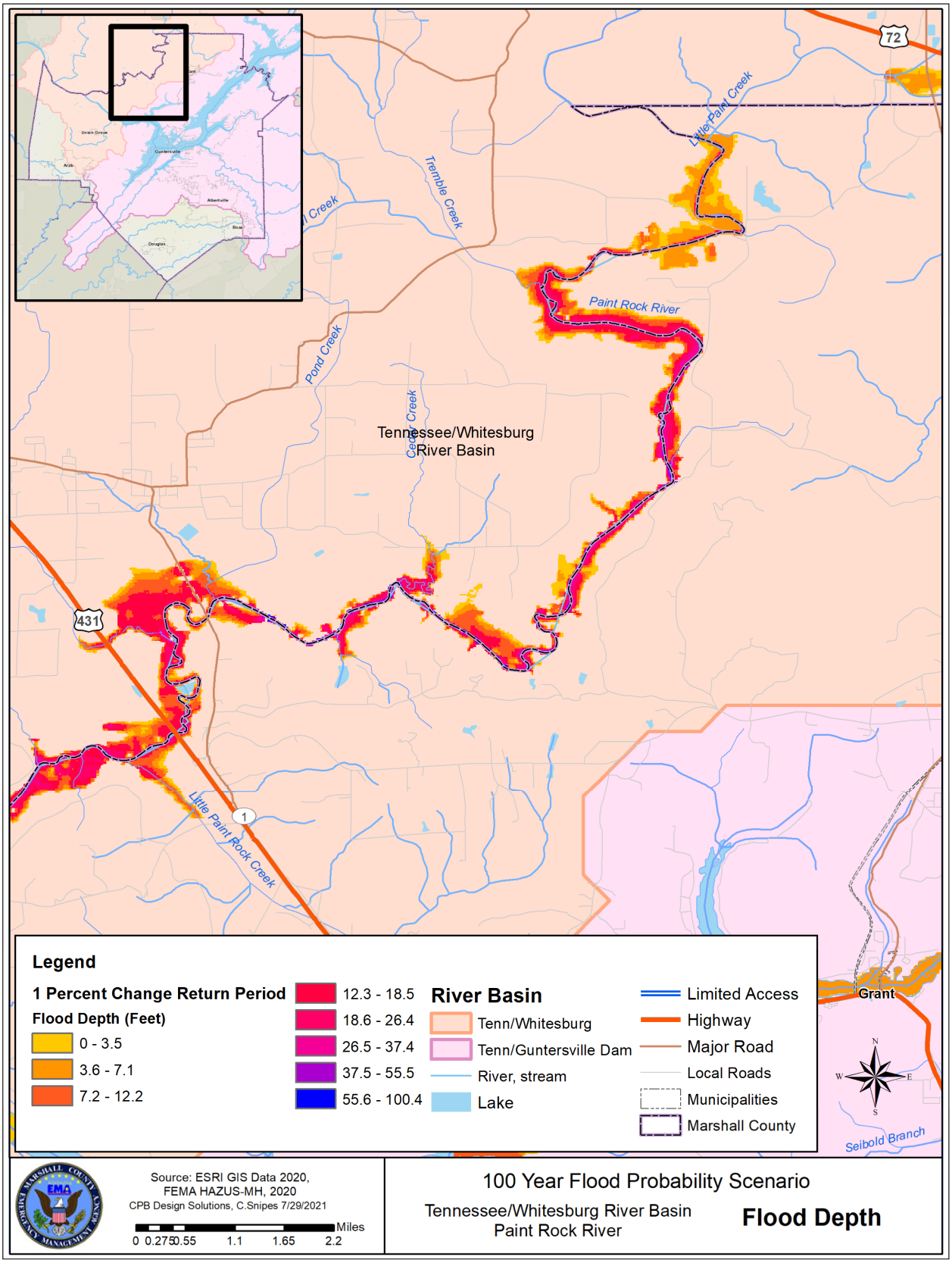
Map 5-14. River Basins of Marshall County



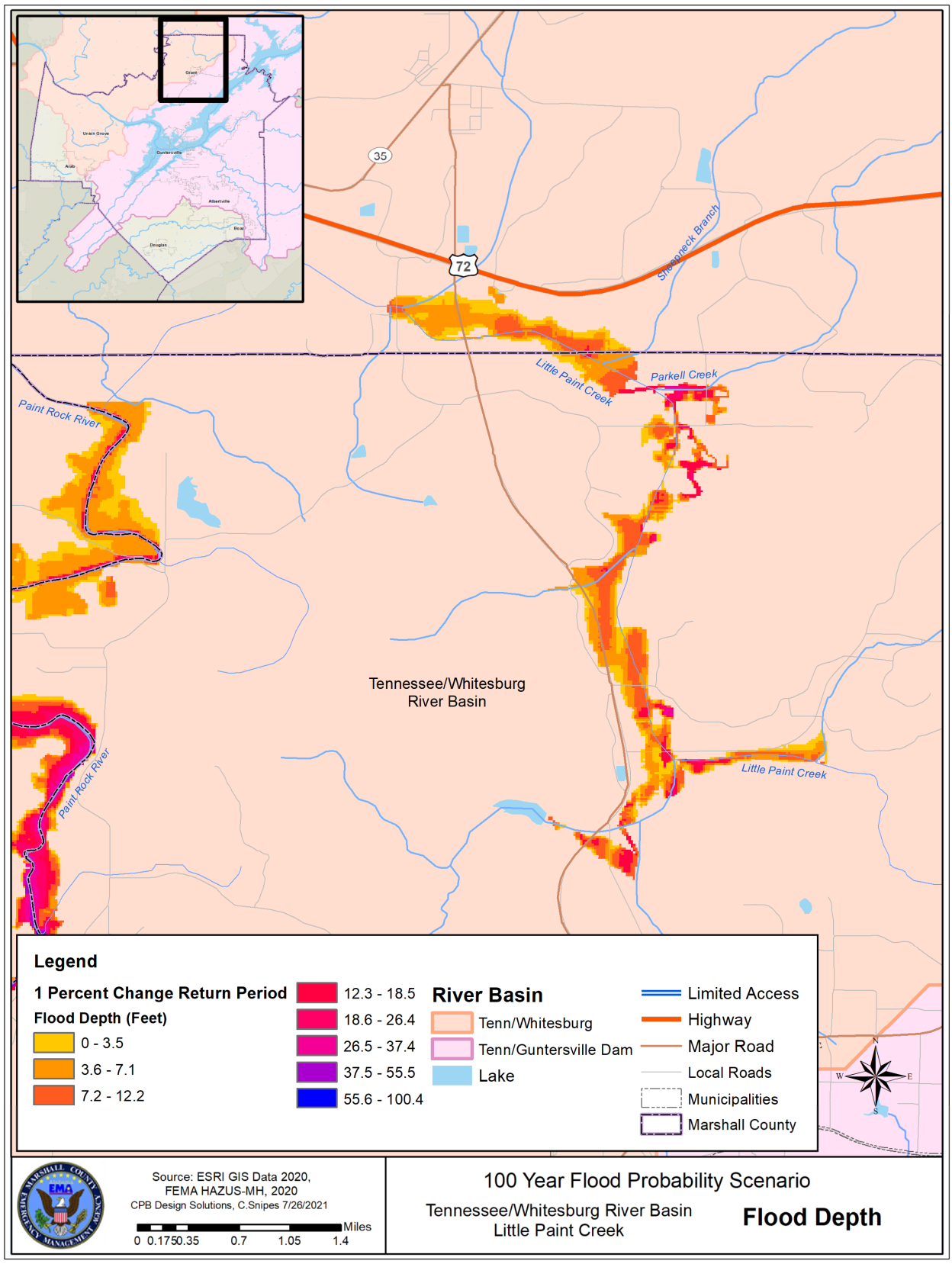
5-15. Flood Depth – Tennessee River and Lower Portion of Paint Rock River



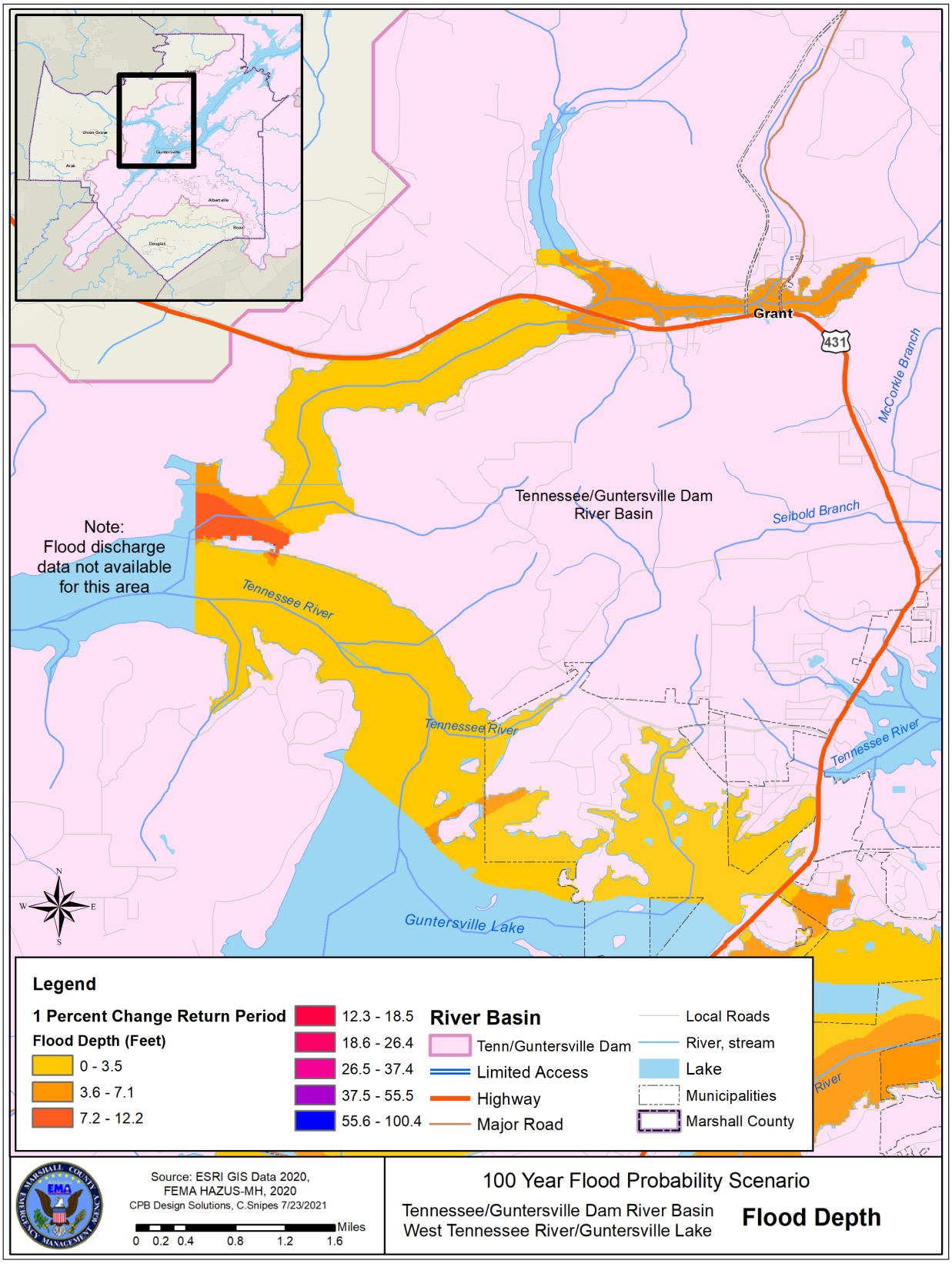
5-16. Flood Depth - Upper Portion of Paint Rock River



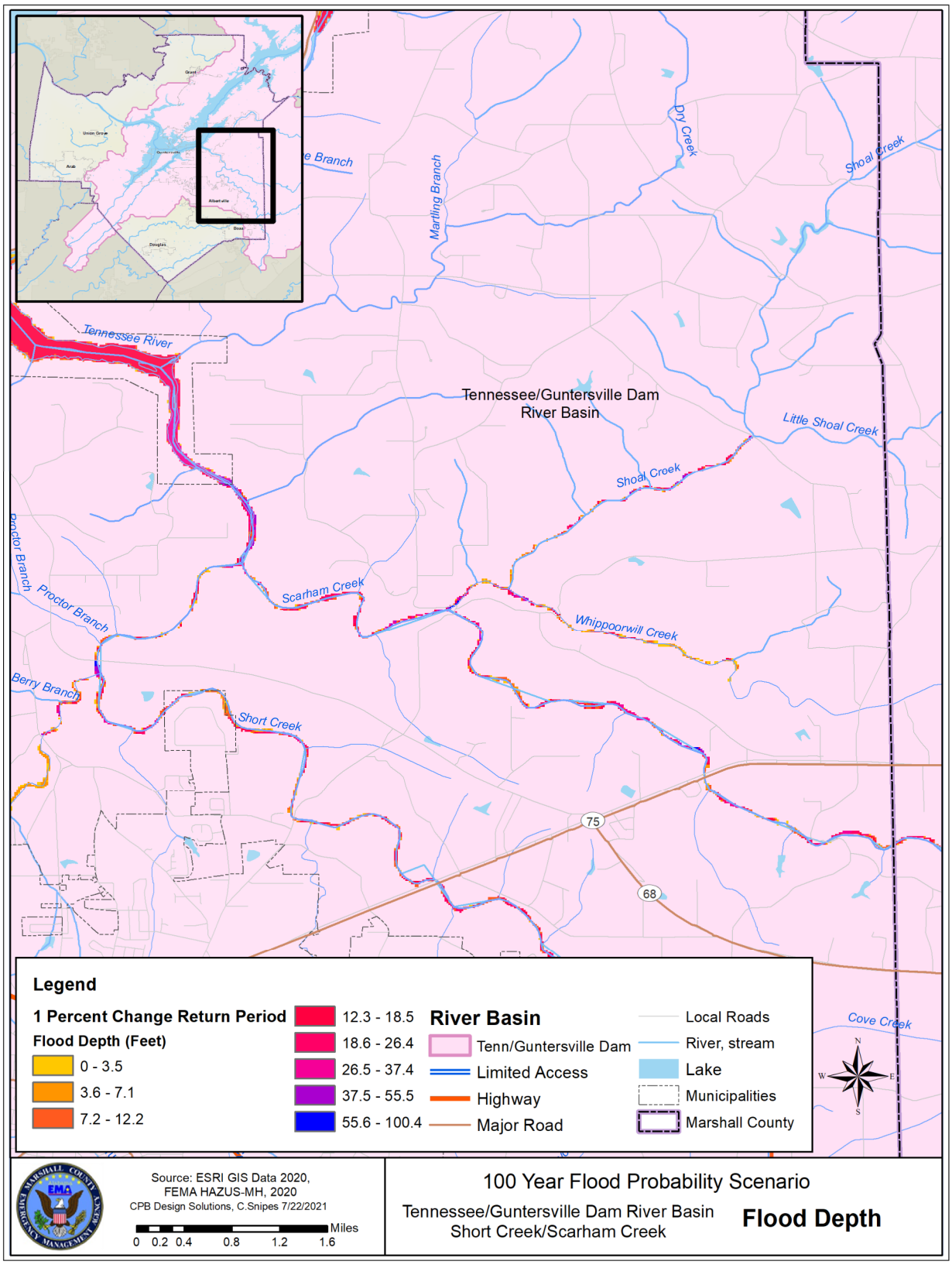
5-17. Flood Depth – Little Paint Creek



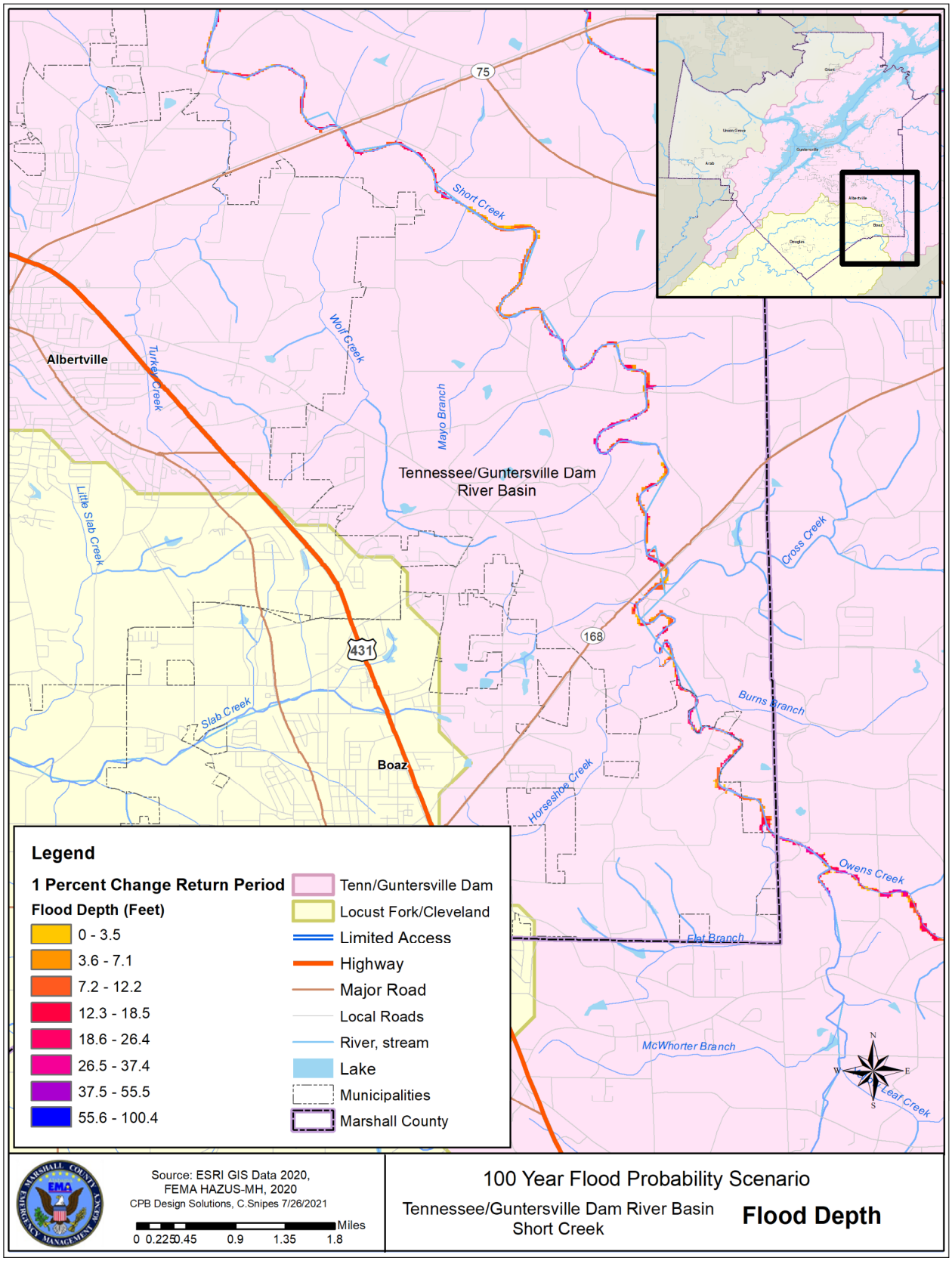
5-18. Flood Depth - West Tennessee River and Guntersville Lake



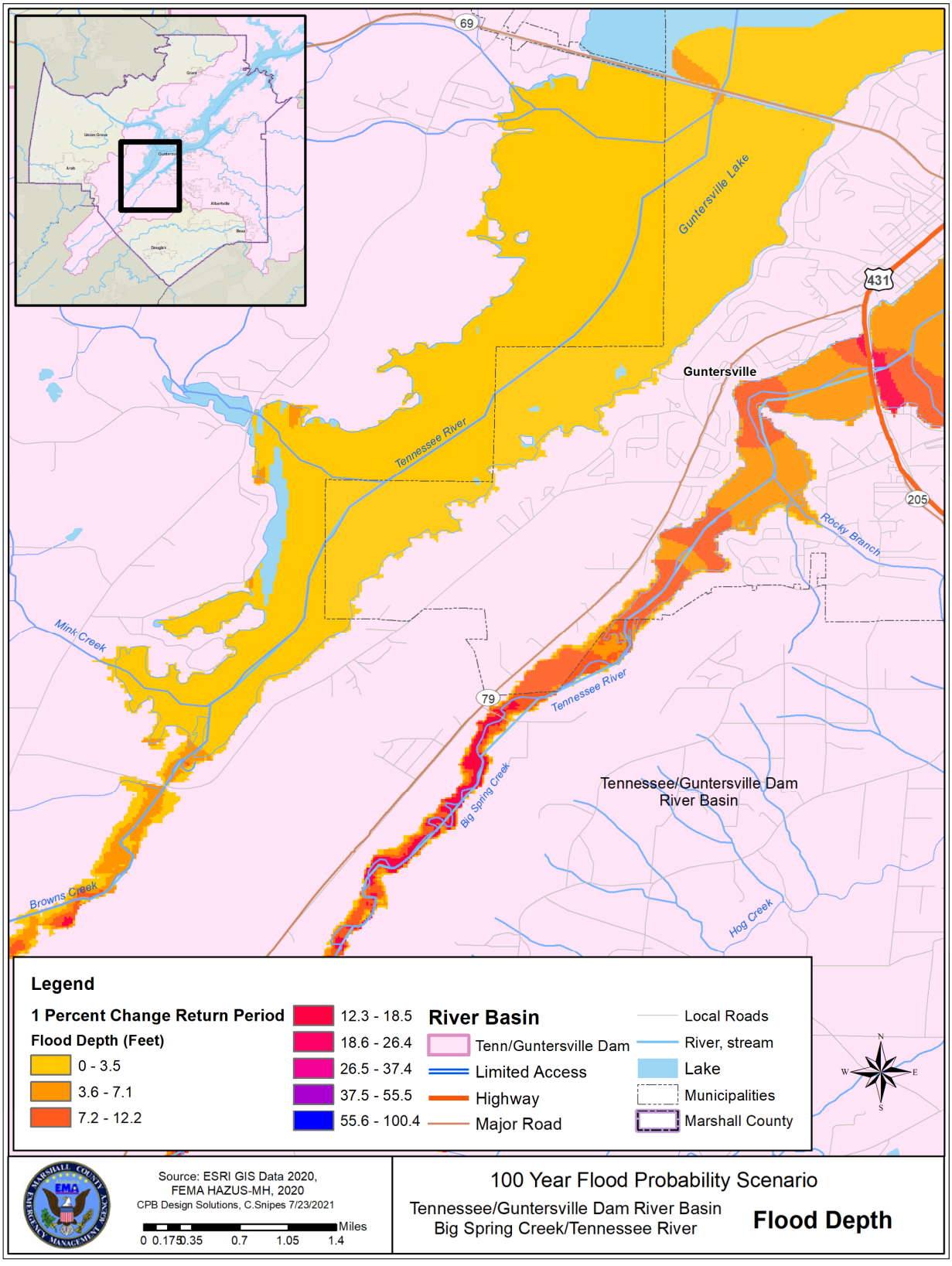
5-19. Flood Depth – Scarham Creek and Upper Portion of Short Creek



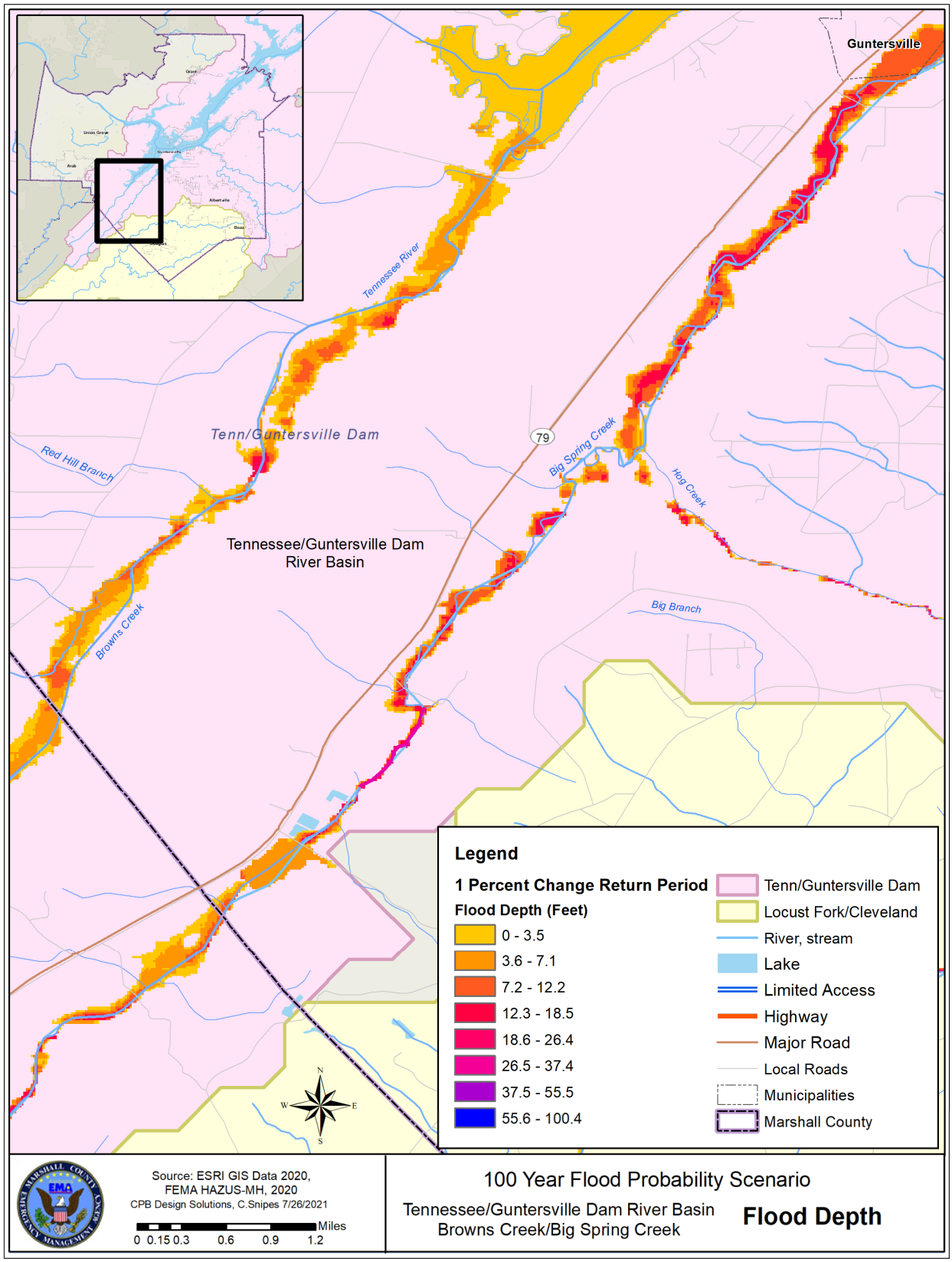
5-20. Flood Depth - Lower Portion of Short Creek



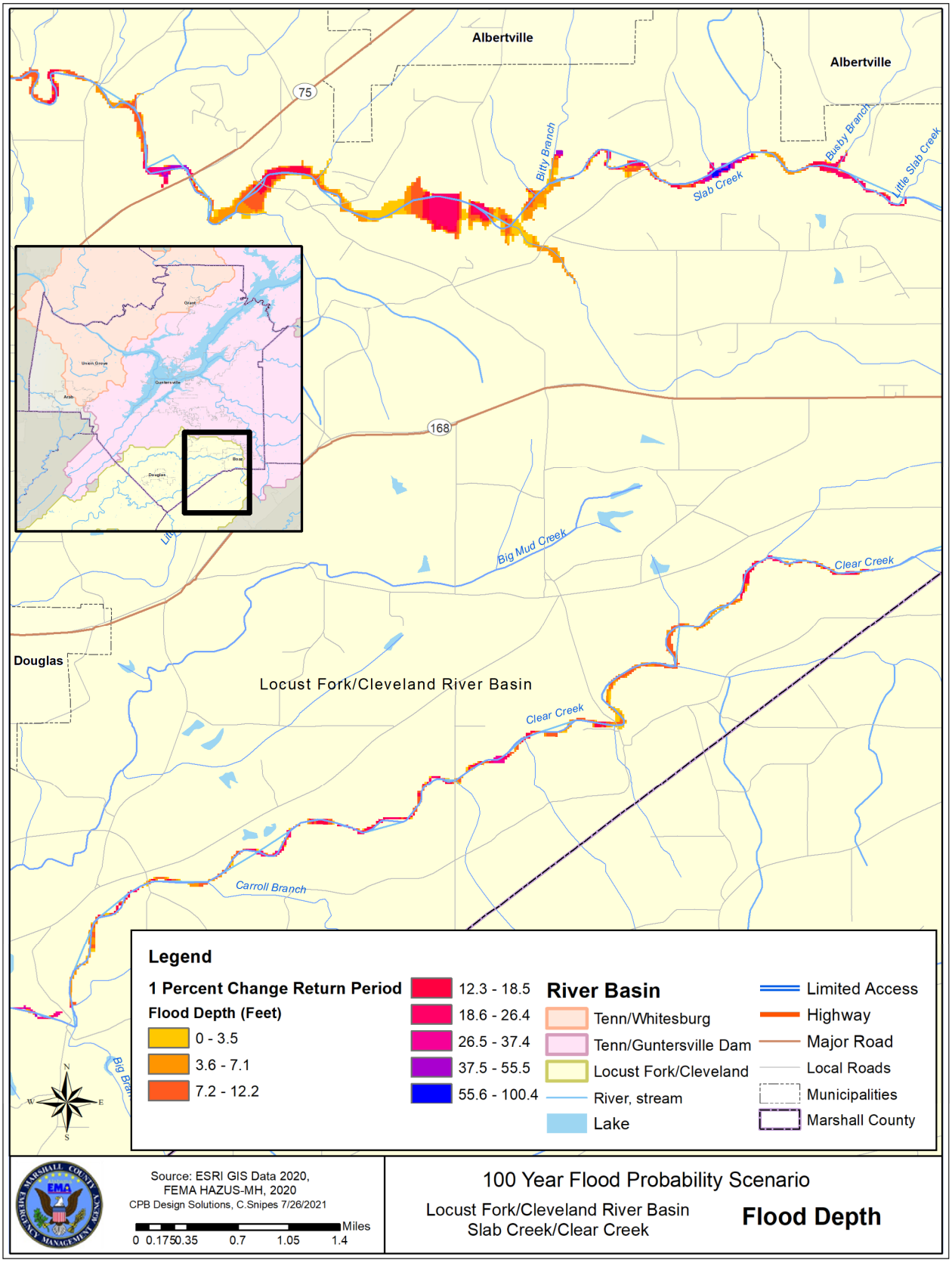
5-21. Flood Depth – Upper Portion of Big Spring Creek



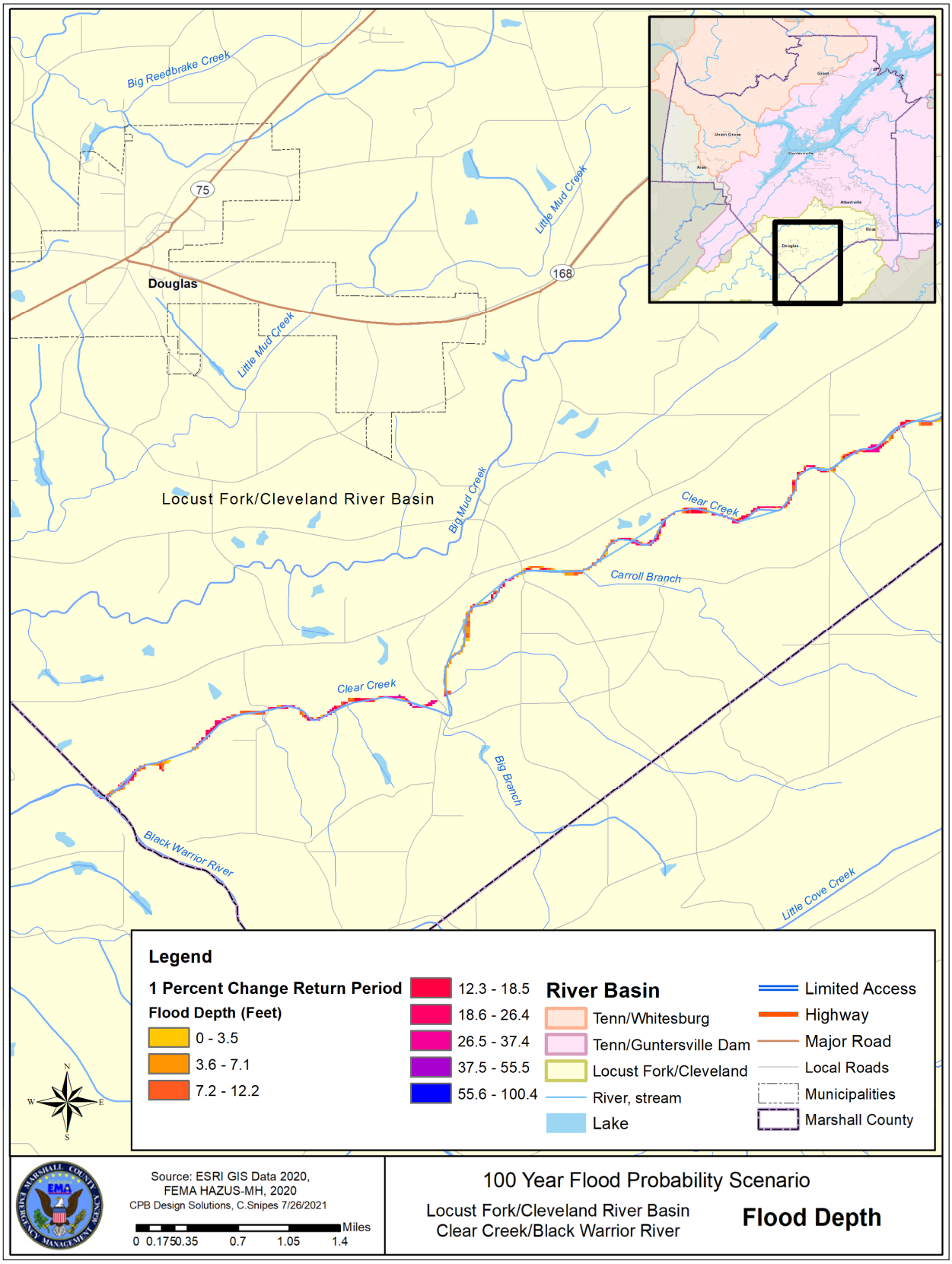
5-22. Flood Depth – Browns Creek and Lower Portion of Big Spring Creek



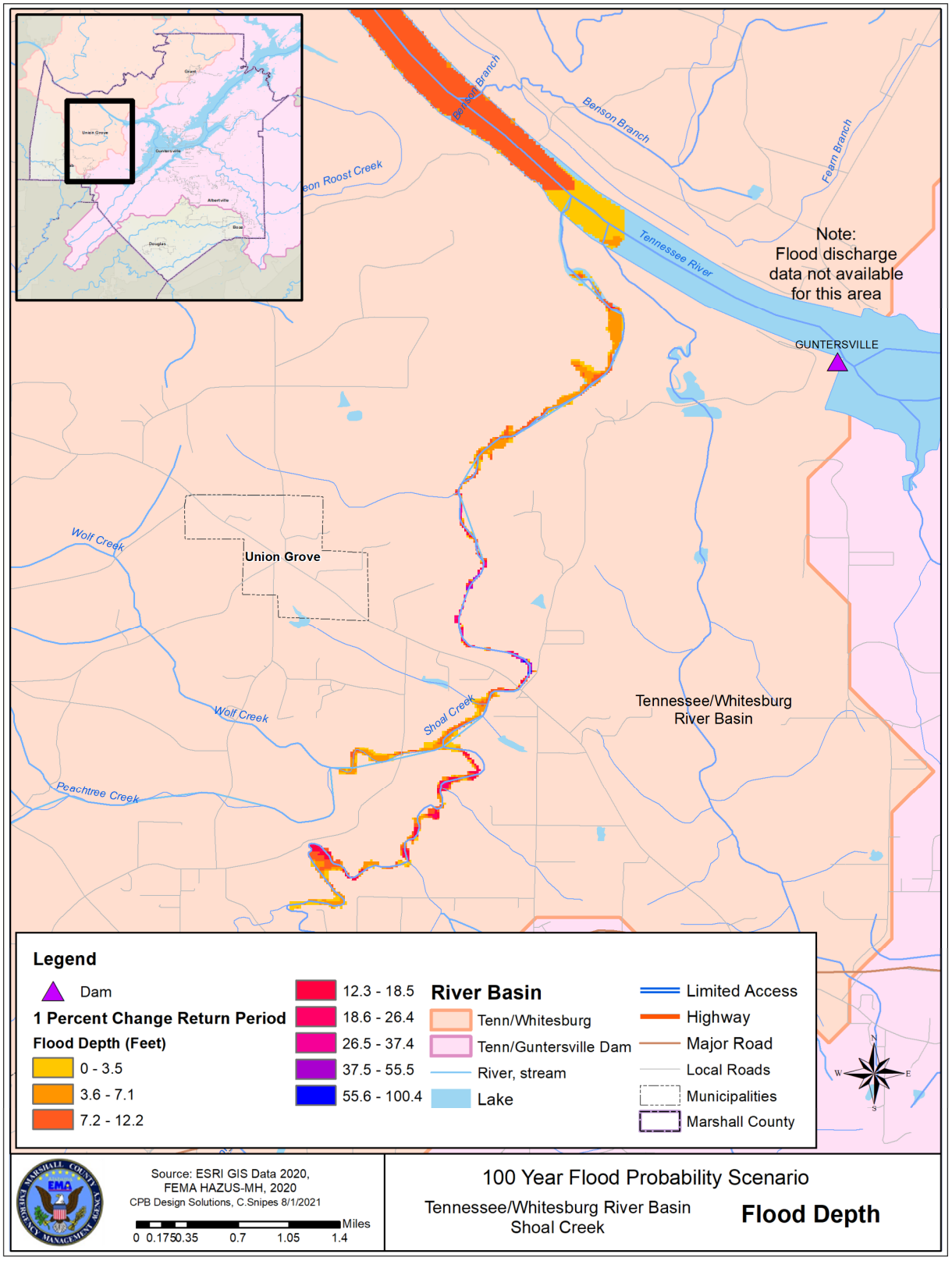
5-23. Flood Depth – Slab Creek and Upper Portion of Clear Creek



5-24. Flood Depth – Black Warrior River and Lower Section of Clear Creek



5-25. Flood Depth – Shoal Creek



A majority of the flooding issues found in Marshall County and its jurisdictions are related to flash floods. Flash flooding events can vary in intensity depending upon the amount and rate of precipitation that falls during a period of time, where the rainfall occurs, and the quality of the drainage system. The effects of a flash flood could be simply several inches of water on the road which requires caution when driving or could result in an event of rushing water that floods buildings and sweeps cars away. Generally, Marshall County has a moderate risk of damages due to flash floods.

Previous Occurrences of Floods

The National Climatic Data Center recorded 36 flood events for Marshall County between 2010 and 2019. Some of the events occurred on the same day at different locations. Table 5-6 shows the events between 2010 and 2019 listed in the NCDC hazard events tables. Events from prior years can be found in Appendix E. According to the average from the NCDC data, Marshall County can expect 3 flooding events per year. To arrive at this average, the outlying data from 2011 was not included.

Table 5-6. Marshall County Flood Events, 2010-2019

Year	Type	Number of Recorded Events
2010	Flash Flood	2
2011	Flash Flood	8
2011	Riverine Flood	2
2012	Flash Flood	4
2012	Riverine Flood	1
2013	Flash Flood	2
2013	Riverine Flood	4
2014	Riverine Flood	1
2015	Flash Flood	3
2016	Riverine Flood	1
2017	Riverine Flood	4
2018	Flash Flood	1
2018	Riverine Flood	1
2019	Riverine Flood	2
Total		**36**

Source: National Climatic Data Center, 2020

According to the Alabama State Plan, Marshall County tied for 9th in reported floods between 1996 and 2017 with 63 floods reported, which averages to approximately 3 events per year. Most of the damage from flooding is limited to infrastructure such as culverts, bridges, and roadways. Occasionally landslides occur.

Flash flooding is the main type of flooding that occurs in Marshall County. This is largely due to inadequately sized, poorly maintained, or dated drainage systems. Some systems have not been upsized to compensate for increases in runoff due to impervious surfaces; other systems are not

properly maintained, allowing build up of materials within storm drains or ditches; while other drainage systems have exceeded their years of viability and have not been replaced since they were built resulting in collapsed pipes and culverts which cause the backup of water.

In looking at locations of flooding within Marshall County, representatives for the jurisdictions provided information about problem areas within their areas. The cities, towns and the county all perform some level of maintenance on their ditches and drainage systems; however, resources are limited and many structures are in need of replacement. The City of Arab reported that are no flooding issues within the city other than some minor drainage issues that have been remediated. At one time there was flooding in the Brookwood Subdivision in Arab and a retention pond was constructed in the vicinity of North Main which rectified the issue. The City of Albertville did not report any flooding issues.

The cities of Guntersville and Boaz have flooding issues which are related to flash flooding during heavy rain events. All issues for both cities are related to inadequately sized drainage systems which results in overtopping the roadways causing washouts and damage to culverts. The City of Guntersville has flooding at the following locations: Meadow Wood Circle, Harbor Ridge Road, Panorama Way East, Sorter Road, O'Brig Avenue, Rayburn Avenue, and 14258 US Highway 431. A listing of areas within Boaz that are impacted by flash flooding is included in Table 5-7. The main source of flooding in Boaz is Slab Creek which runs from east of 431 westward through the north part of the city to Mt. Vernon Road.

Table 5-7. Flood Information – City of Boaz

Date of Event	Location
5/4/2021	Butler Ave and shady Creek Circle
5/4/2021	Alabama 205 and Rains Ave
5/4/2021	Butler Ave and Stephens St.
5/4/2021	Willow Road and Bel Air St.
5/4/2021	Mount Vernon at Slab Creek
5/4/2021	Mcville Road and Thomas Ave
5/4/2021	Old Denson Road approx.
5/4/2021	Old Guntersville Gadsden Road and 105 Bradford Street
5/4/2021	Snellgrove Ave. and Hillcrest Cemetery
5/4/2021	Elm St. and Martin Ave
5/4/2021	Billy Dyer Blvd and McCleskey
4/12/21	AL Hwy 168 and Bethsaida Rd.
4/2/19	AL Hwy 168 and Bethsaida
4/2/19	Mt Vernon Road and Slab Creek
2/22/19	Darnell St. and Maple Ave

Date of Event	Location
2/22/19	Blanch Drive
2/22/19	W. Henderson and River Oaks Road
2/22/19	Darnell St. Between Wells Ave and Martin Ave
2/22/19	Mount Vernon Road and slab Creek
1/23/19	Darnell Street and Wells Ave
1/23/19	Maple Ave, Between Elm and Darnell Street

The towns of Grant, Douglas and Union Grove's flood management is under the County Commission's jurisdiction. Douglas is within District Three, Grant falls under District Two, and Union Grove is under District One. The County Commissioners provided information about the flooding that has occurred within their districts. Map 5- 26 created by the County Commission, shows the delineation of the county districts. Table 5-8 provides the locations of flooding in each district, the cause of the flooding, if it is a recurring issue and what mitigation steps have been taken.

5-26. Marshall County Commission Districts

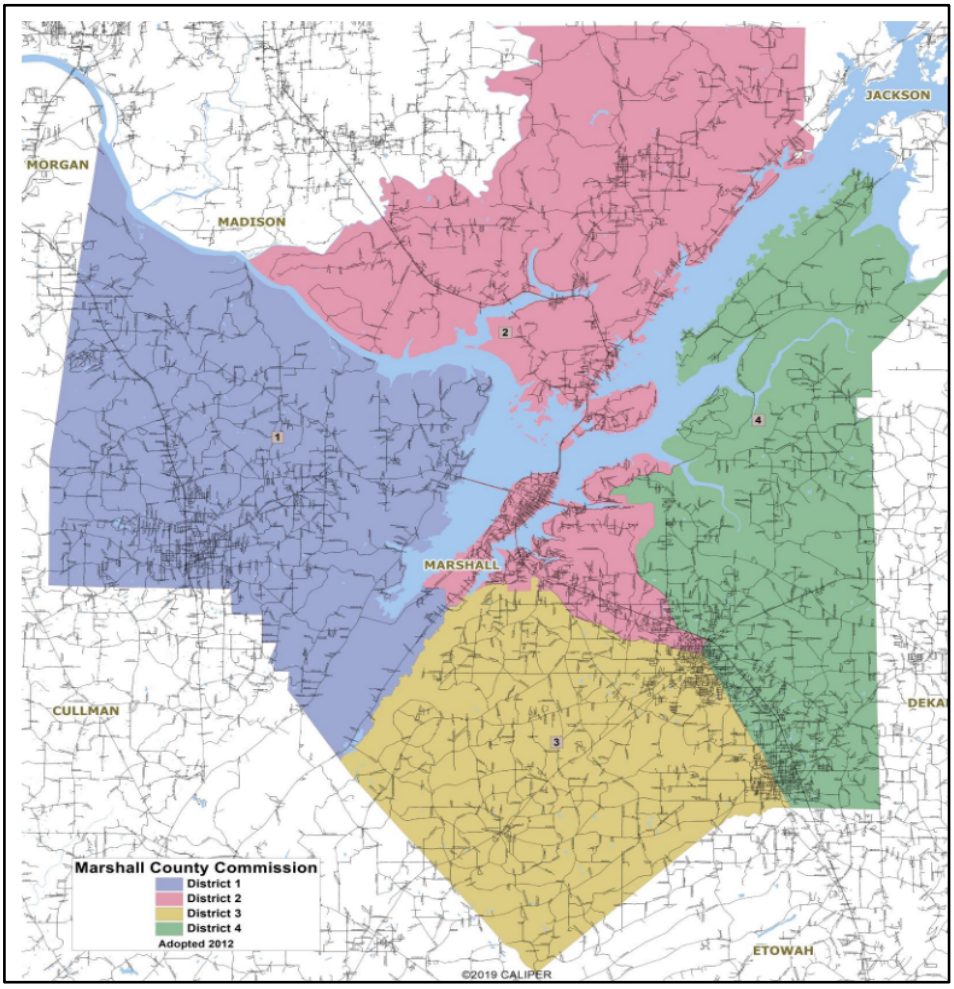


Table 5-8. Flood Information – Marshall County, Unincorporated

County District	Date of Event	Location	Cause	Reoccurring Issue Y/N	Mitigation Action Taken
District 1	12/25/15	Bottom of mountain Fry Gap Road	Box culvert collapsed	N	Replaced w/ 80' of 48" tiles
District 1	12/25/15	Norwood Drive	Rusted out culvert	N	Replaced culvert
District 1	12/25/15	Bluffview Drive	Road washed out	N	Rebuilt roadway & Paved over it
District 1	12/25/15	Aldridge Road	Mountain road Slide off	N	Rebuilt roadway & Paved over it
District 1	12/25/15	Feemster Gap (mountain road Section)	Mountain road Slide off	N	Vacated
District 1	04/12/20	Dove Circle	Rusted out culvert	N	Replaced w/ 80' of 24" tiles
District 1	04/12/20	Bluffview Drive	Heavy rainfall in short time period	Y	Repair washout at culvert
District 1	04/12/20	Bridge Road	Heavy rainfall in short time period	Y	Repair shoulders
District 1	04/12/20	Brookline Ridge Road	Heavy rainfall in short time period	Y	Shoulder repair/ditch work
District 1	04/12/20	Eagle Rock Road	Heavy rainfall in short time period	Y	Shoulder repair/ditch work

County District	Date of Event	Location	Cause	Reoccurring Issue Y/N	Mitigation Action Taken
District 1	04/12/20	Frontier Road	Heavy rainfall in short time period	Y	Repair washout at culvert
District 1	04/12/20	Gentry Road	Heavy rainfall in short time period	Y	Repair washout at bridge
District 1	04/12/20	Greenbriar Cove Road North	Heavy rainfall in short time period	Y	Shoulder repair/ditch work
District 1	04/12/20	Halston Road	Heavy rainfall in short time period	Y	Repair washout at bridge
District 1	04/12/20	Hester Road	Heavy rainfall in short time period	Y	Repair washout at culvert
District 1	04/12/20	Hickory Circle	Heavy rainfall in short time period	Y	Repair washout at culvert
District 1	04/12/20	Hidden Valley Road	Heavy rainfall in short time period	Y	Shoulder repair/ditch work
District 1	04/12/20	Justin Lane	Heavy rainfall in short time period	Y	Repair washout at culvert
District 1	04/12/20	Lafarlette Lane	Rusted out culvert	N	Replaced w/ 10’ of 24” tile
District 1	04/12/20	Manchester Road	Heavy rainfall in short time period	Y	Shoulder repair/ditch work
District 1	04/12/20	Mat Morrow Road	Heavy rainfall in short time period	Y	Repair washout at culvert

County District	Date of Event	Location	Cause	Reoccurring Issue Y/N	Mitigation Action Taken
District 1	04/12/20	Midway Road	Heavy rainfall in short time period	Y	Repair washout at culvert
District 1	04/12/20	Mobbs School Road	Heavy rainfall in short time period	Y	Repair washout at bridge
District 1	04/12/20	Mt. Carmel Drive	Heavy rainfall in short time period	Y	Repair washout at culvert
District 1	04/12/20	Nathan Road	Heavy rainfall in short time period	Y	Repair washout at culvert
District 1	04/12/20	Nightingale Lane	Heavy rainfall in short time period	Y	Repair washout at culvert
District 1	04/12/20	Norwood Drive	Heavy rainfall in short time period	Y	Repair washout at culvert
District 1	04/12/20	Tinner Mayo Road	Heavy rainfall in short time period	Y	Repair washout at culvert
District 2	4/12/20	Campbell Rd	Heavy rainfall in short period of time	N	Replaced cross drain; road section washed out
District 2	4/12/20	Island Dr	Heavy rainfall in short period of time	N	Replaced cross drain and repaired wash away at cross drain
District 2	4/12/20 2/20/19	White Elephant Rd	Heavy rainfall in short period of time	N	Repaired wash away at cross drain
District 2	4/12/20	Old Union Rd (1074)	Heavy rainfall in short period of time	N	Repaired wash away at cross drain

County District	Date of Event	Location	Cause	Reoccurring Issue Y/N	Mitigation Action Taken
District 2	4/12/20 12/25/15	Old Union Rd (838)	Heavy rainfall in short period of time	N	Repaired wash away at shoulder
District 2	4/12/20	Convict Camp Rd	Heavy rainfall in short period of time	N	Repaired wash away at driveway
District 2	4/12/20	Elkins Rd	Heavy rainfall in short period of time	N	Repaired wash away at cross drain
District 2	4/12/20	Esslinger Rd	Heavy rainfall in short period of time	N	Repaired wash away at cross drain
District 2	4/12/20	Randles Rd	Heavy rainfall in short period of time	N	Repaired wash away at cross drain
District 2	4/12/20 12/25/15	Swearengin Rd	Heavy rainfall in short period of time	N	Repaired wash away at guardrail
District 2	4/12/20	Wendy Rd	Heavy rainfall in short period of time	N	Repaired wash away at driveway pipe
District 2	12/25/15	Ayers Rd	Heavy rainfall in short period of time	N	Repaired wash out at cross drain
District 2	12/25/15	Buck Island DR	Heavy rainfall in short period of time	N	Shoulder of road washed out, rebuilt
District 2	12/25/15	Carlton Rd	Heavy rainfall in short period of time	N	Wash out at bridge, repaired, plant mix
District 2	12/25/15	Elkins Rd	Heavy rainfall in short period of time	N	Shoulder of road washed out, rebuilt

County District	Date of Event	Location	Cause	Reoccurring Issue Y/N	Mitigation Action Taken
District 2	12/25/15	Firetower Rd	Heavy rainfall in short period of time	N	Pipe washed out, cleaned ditches
District 2	12/25/15	Honeycomb Rd	Heavy rainfall in short period of time	N	Re-laid washed out pipe
District 2	12/25/15	October Way	Heavy rainfall in short period of time	N	Road washed out, rebuilt road
District 2	12/25/15	Pine Needle Trace	Heavy rainfall in short period of time	N	Replaced washed out pipe
District 2	12/25/15	Sanders Dr	Heavy rainfall in short period of time	N	Replaced washed out pipe
District 2	12/25/15	Shadyside Dr	Heavy rainfall in short period of time	N	Shoulder of road washed out, rebuilt
District 2	12/25/15	Snug Harbor Rd	Heavy rainfall in short period of time	N	Repaired wash out at cross drain
District 2	12/25/15	Starnes Loop Rd	Heavy rainfall in short period of time	N	Re-laid washed out pipe, cleared ditches
District 2	12/25/15	Welcome Home Rd	Heavy rainfall in short period of time	N	Repaired wash out at cross drain
District 2	12/25/15	Winkles Rd	Heavy rainfall in short period of time	N	Repaired wash out at cross drain
District 3	1/1/20	West of Main Street between 2nd and 3rd Ave	Poor Drainage. 4 inches of rain in 2 hours.	N	Installation of retention pond.

County District	Date of Event	Location	Cause	Reoccurring Issue Y/N	Mitigation Action Taken
District 3	12/25/16	Smith Road, Hyatt Nixon Chapel, Alabama	Massive rainfall 14inches of rain in 24 hrs. Trees became battering rams that removed 26' of roadway.	N	Installation of Larger Drainage Pipe, Enlarged Water Ditch
District 3	12/25/16	Horton Road Bridge	Massive rainfall 14 inches of rain in 24 hours	Y	Remove trees and debris from under bridge cleaned drainage hole on bridge
District 3	12/25/16	Whitten Road Bridge	Massive rainfall 14" in 24 hours	N	Tore down Concrete slab, installed 3 60" pipes
District 3	12/25/16	Needmore Bridge	Massive rainfall 14" in 24 hours'	Y	No remedy taken
District 3	4/26/14	Old Oneonta Cut-Road Bridge	Massive Rainfall	N	Built New Three Case Bridge
District 3	12/25/16	White Oak Road Bridge	Massive Rainfall	Y	Low Bridge, Narrow ravine, no known remedy
District 4	4/12/20 12/25/15	Tick Duckett Rd	Heavy rainfall in a short period of time	y	Could only restore to original state due to lack of Funds
District 4	4/12/20	Stone Rd	Heavy rainfall in a short period of time	y	Repair approaches
District 4	4/12/20	Kennamer Farm Rd	Heavy rainfall in a short period of time	N	Rebuild shoulders & clean ditches

County District	Date of Event	Location	Cause	Reoccurring Issue Y/N	Mitigation Action Taken
District 4	4/12/20	Terrell Rd	Heavy rainfall in a short period of time	N	Rebuild shoulders & clean ditches
District 4	4/12/20	Old Bethel Rd	Heavy rainfall in a short period of time	N	Rebuild shoulders & Clean ditches
District 4	4/12/20	Baker Rd	Heavy rainfall in a short period of time	N	Rebuild shoulders & clean ditches
District 4	4/12/20	Ross Rains Dr	Heavy rainfall in a short period of time	N	Culvert replacement & Clean ditches
District 4	4/12/20	Arlie Lacy Rd	Heavy rainfall in a short period of time	N	Rebuild shoulders & clean ditches
District 4	4/12/20	Gaines Circle	Heavy rainfall in a short period of time	N	Rebuild shoulders & clean ditches
District 4	4/12/20	George Wallace Dr	Heavy rainfall in a short period of time	N	Debris Cleanup & ditch cleanout
District 4	4/12/20	Gaines Rd	Heavy rainfall in a short period of time	N	Debris Cleanup & ditch cleanout
District 4	4/12/20	Mathis Mill Rd	Heavy rainfall in a short period of time	N	Rebuild shoulders & clean ditches
District 4	4/12/20	Terrell Rd	Heavy rainfall in a short period of time	N	Driveway Repair
District 4	4/12/20	Old Water Plant Rd	Heavy rainfall in a short period of time	N	Cross Drain Repair & ditch cleanout

County District	Date of Event	Location	Cause	Reoccurring Issue Y/N	Mitigation Action Taken
District 4	4/12/20	Swords Rd	Heavy rainfall in a short period of time	N	Rebuild shoulders & clean ditches
District 4	4/12/20	Wilkerson Dr Bridge	Heavy rainfall in a short period of time	N	Repair approaches
District 4	4/12/20	Sampson Rd	Heavy rainfall in a short period of time	N	Rebuild shoulders & clean ditches
District 4	4/12/20	West Lane	Heavy rainfall in a short period of time	N	Culvert washout repair

Christmas Day 2015 saw an extensive flooding event in Marshall County involving both flash floods and riverine flooding. The rainfall totaled 9 inches in about 18 hours on December 25th according to a Guntersville Dam rain gauge, and the subsequent flash floods washed out roads and bridges, damaged buildings, disrupted the power supply, and trapped and washed away cars across several counties, including Marshall. Due to the significant rainfall in such as short amount of time, the Tennessee Valley Authority closed the area around the Guntersville Dam to boat and barge traffic and moved 2 million gallons of water per second through the spillways of the dam to prevent riverine flooding. On September 26, 2018, a flash flood in Albertville resulted in an emergency rescue of a woman and her two children from their car that became trapped in flood waters.



February of 2019 saw a 20-year high flood level due to extensive rainfalls that caused people to be trapped in their homes. It was recorded as the wettest February in 30 years for Arab. From February 17 to February 24, twelve inches of rain fell and cut off the Greenbriar Cove Community with no way in or out of the community. Flooding of Paint Rock River even perpetuated an emergency rescue of a dialysis patient several days after the initial flooding event. The Tennessee River crested at 38.67 feet at Guntersville Dam within inches of the top of the spill gates. Much flooding in the Tennessee Valley area rivaled floods of March 1973 and May 2003. The Tennessee Valley Authority (TVA) conducted a controlled water release to stave off riverine flooding.



Credit: Alabama News Center

Much of the flash flooding is exacerbated by poorly maintained or dilapidated drainage systems. Flooding issues on January 23, 2016 along Sunset Drive were caused by a clogged drain and saturated ground in Guntersville. There was debris of limbs and trash in the in culverts along the road. On June 30, 2017, continuous rain led to flooding in Albertville which was made worse by overgrown brush at the end of drainage ditch off Powell Boulevard. Five sites in Boaz are known to be trouble areas for flash flooding. Those are the intersection of Sparks Avenue and Highway 205, Mt. Vernon Road at Slab Creek, South Broad Street, South Walnut Street and Snellgrove, and at Old Denson Road. Some of the drainage ditches are on private property which adds to the problems.

Probability of Future Flood Events

Past trends indicate regular occurrences of heavy rainfalls will continue to create conditions of flash flooding throughout Marshall County. Much of the probability will be contingent on the ongoing

maintenance and repair of drainage systems and bridges. In relation to riverine flooding, 100- and 500-year flood events will be unlikely from year to year, and as long as the dam is maintained properly and water release occurs during times of heavy flow, damages should not be substantial or widespread.

With respect to climate change, an increase in temperature and moisture in the air can lead to heavier precipitation events: however, the causes of flooding are varied, including improper land uses in floodplains, surface paving, and the quality of storm drainage systems. The extent of damages can also vary depending on quality of flood forecasting, settlement patterns, warning systems, and citizens' adherence of the recommendations of authorities with regard to flood warnings.

Many of the causes of flooding in Marshall County could be lessened through mitigation measures such as maintenance of drainage systems, replacement of problem culverts with bridges, and building retention ponds in highly impervious areas. There are some issues that will require outside help to rectify, possibly through state regulation since the county's hands are tied on many measures due to their lack of home rule. Such measures include regulation in regard to the placement of fiber optic cable. When county crews perform maintenance on the ditches, many cables become damaged due to the shallowness of the cable depth. More mitigation measures in relation to floods can be found in Chapter Six – "Mitigation Strategy".

5.3.4 Hurricanes

Marshall County has been involved in six federal disaster declarations for hurricanes or tropical storms since 2000 including tropical storms Isadore (2002) and Ida (2009) and hurricanes Ivan (September 2004), Dennis (July 2005), Katrina (August 2005), Gustav (August 2008), and Ike (September 2008), Isaac (August 2012) and Irma (September 2017). Although Marshall County is approximately 296 miles inland from the Gulf Coast, it is not immune to the damaging effects of hurricanes.

Location of Potential Hurricanes

All Marshall County locations and jurisdictions share equal risk for damage from hurricanes, tropical storms, and tropical depressions. According to a probability model of hurricanes using FEMA's Hazus-MH hurricane module, peak wind gusts from a 100-year probability hurricane event approach 67 mph and decrease slightly in the northern areas of Marshall County. In this 100-year event scenario, the storm track lies immediately to the west of Marshall County, traveling to the northeast. This is similar to the Hurricane Opal track of October 1995 and the Hurricane Ivan track of September 2004. With the hurricane track occurring in the western section of the county, the storms that develop due to the hurricane are likely to have an impact throughout Marshall County.

Extent and Intensity of Potential Hurricanes

Inland hurricanes will dissipate by the time they reach Marshall County, which is located almost 300 miles from the closest Gulf Coast landfall location. The after-effects of the hurricane can still impact the county, but it would be downgraded to either a tropical depression or tropical storm. If rated as a tropical depression, it would present with maximum sustained winds of 38 mph or less. If rated as an inland tropical storm, maximum sustained winds could go as high as 73 mph. High wind gusts of up to

67 mph as demonstrated through the Hazus-MH 100-year scenario can cause trees, signs, and power lines to topple; damage to buildings; and sustained utility outages. These types of damage, similar to those of a low-level tornado, could result in bodily injury or even death.

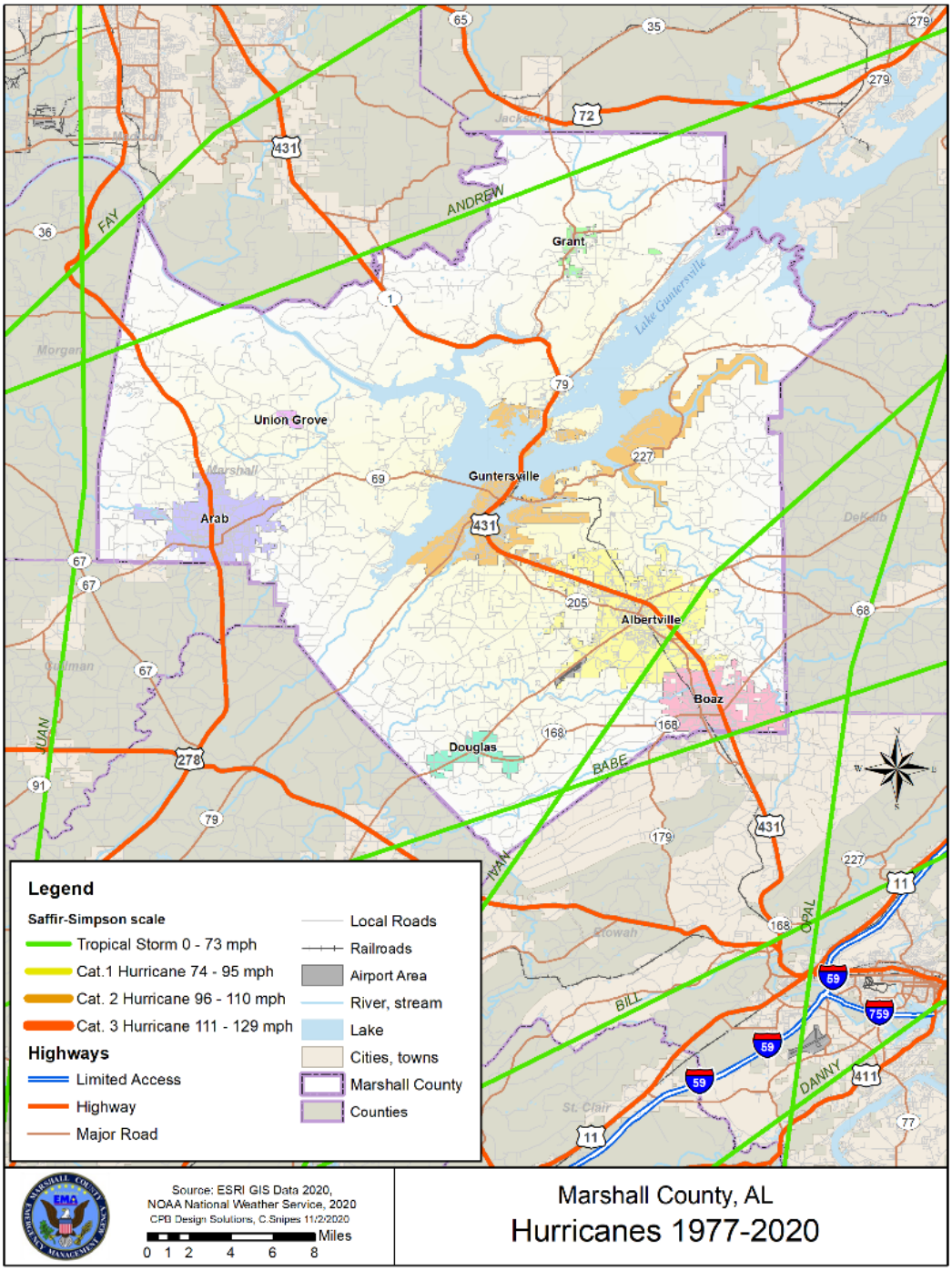
According to hurricane records, half of all hurricanes produce one or more tornadoes. If a tornado develops as a result of a hurricane, it will typically do so within 12 hours of landfall and during daylight hours. This timeframe is within reach of Marshall County. Normally, a tornado watch will follow the projected inland path of a hurricane.

Tropical storms and depressions are often responsible for heavy rain events that can cause flooding. A weak tropical storm or depression moving slowly, or lingering can cause more damage due to flooding than some fast-moving storms.

Previous Occurrences of Hurricanes

According to NCDC records, between 2010 and 2019 Hurricane Isaac was the only hurricane to impact Marshall County. Hurricane Isaac was rated as a Category 1 Hurricane when it made landfall in Louisiana. A significant weather event for Marshall County involving a hurricane occurred on September 16, 2004. Hurricane Ivan made landfall around 1:00 AM CST near Gulf Shores, Alabama. By 10 PM, the storm had passed through Marshall County as a tropical depression with sustained winds of 35 mph and gusts of up to 60 mph. The storm knocked down trees and powerlines and dropped several inches of rain. The paths of the hurricanes and tropical storms since 1977 are shown on Map 5-27 - “Hurricane Paths, 1977-2020,” which shows all areas of Marshall County have been equally affected. Other hurricanes affecting Marshall County since 2004 include the remnants of Dennis on July 10, 2005, Katrina on August 29, 2005, Isaac on September 21, 2012, and Irma, September 11, 2017.

Map 5-27. Hurricane Paths, 1977-2020



Probability of Future Hurricane Events

As is the case with most natural hazards, past records are no guarantee of the probability of future events affecting Marshall County. Given its inland location of approximately 300 miles north of the Gulf Coast, Marshall County can continue to expect the remnants of frequent Gulf Coast hurricanes and occasional direct impacts of tropical depressions. Hurricane path records since 1851 show the

likelihood of continued direct paths through or near Marshall County. The county's location within ten hours of a Gulf Coast hurricane landfall would cause the hurricane to dissipate to tropical depression or tropical storm status. The probable impacts of tropical depressions or tropical storms directly passing through or near Marshall County would be damages resulting from high wind gusts above 65 mph, heavy rainfall causing localized flooding of streams and drainage ways, and possible tornadoes.

It is theorized that climate change may affect future hurricane events. The hurricane season has been expanded in recent years. The typical April through November hurricane season is lasting longer. According to Meteorologist Jeff Masters, this extension is likely due to warmer seawater and an increase of moisture in the atmosphere. A hurricanes' most significant damage is caused by high winds which can affect Marshall County and storm surges which occur much closer to where the storm makes landfall. While the effect of climate change on winds is debatable, there is a general consensus that sea levels are rising and water temperatures are increasing as a direct result of global warming which is expanding the time that hurricanes and tropical storms are occurring and potentially making landfall each year.

Mitigation measures are the same for hurricanes as for severe storms and tornadoes because the remnants of the hurricane are usually in the form similar to a severe storm or a tornado. Mitigation measures for such events can be found in Chapter Six – "Mitigation Strategy".

5.3.5 Winter Storms and Extreme Cold

In general, the state of Alabama does not experience winter storms often; however, as Marshall County is located at a high elevation in comparison to many other areas of the state, the county is more likely to experience winter storms than is typical for the state as a whole. These storms are rare and usually mild with light snow or short periods of freezing rain. According to the National Weather Service (NWS), the county receives, on average, 2.4 inches of snowfall annually with about one event per year.

Winter temperatures in Marshall County are generally moderate, with an average temperature of 43.7° F and average minimums at 33.9° F. Extreme cold temperatures are rare but do occur. These rare temperature lows can result in burst plumbing in homes, burst water distribution pipes under roadways and bridges, and occasional deaths due to lack of sufficient heating or exposure to cold. The lowest recorded temperature of -11° F occurred in 1985. See Table 5-9 for Marshall County winter weather observations .

Table 5-9. Marshall County Winter Weather Observations

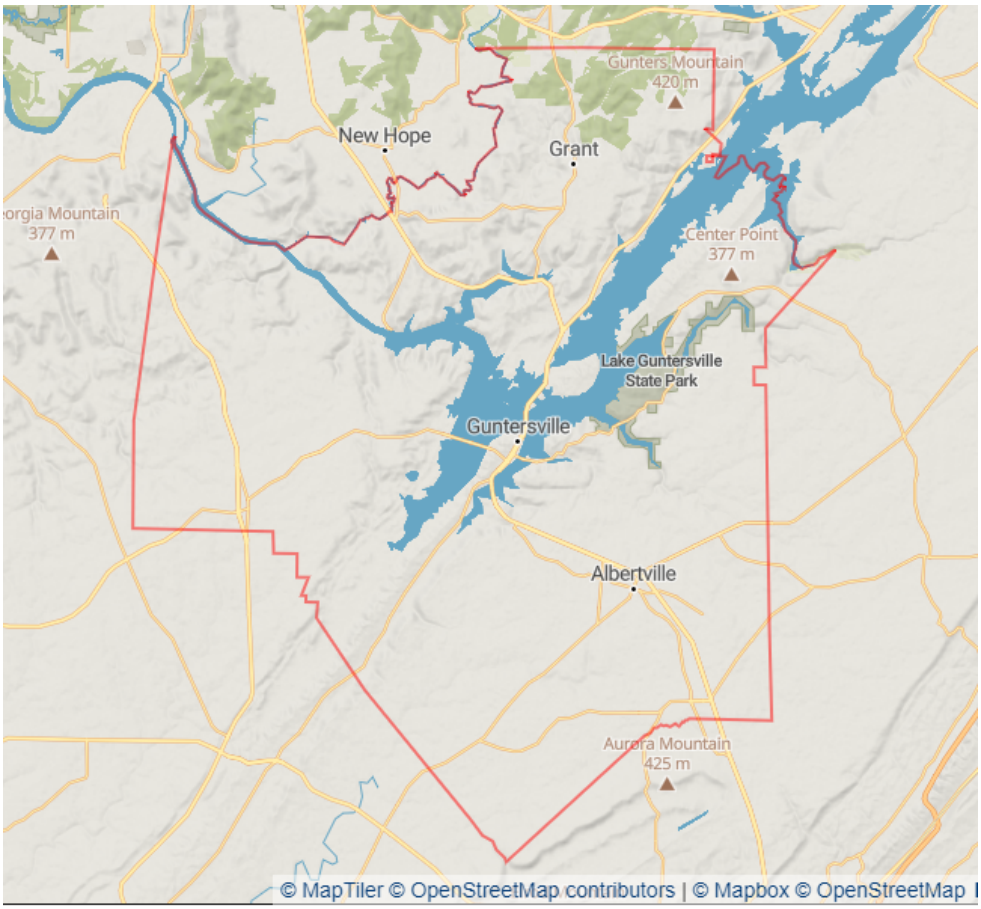
Weather	Observation
Average Winter Temperature	43.7° F
Average Winter Minimum Temperature	33.9° F
Lowest Temperature (January 21, 1985)	-11° F
Average Season Snowfall	2.4 inches
Largest Snowfall (1963)	24.0 inches

Source: National Weather Service, 2019

Location of Potential Winter Storms and Extreme Cold

Marshall County and its participating jurisdictions are equally likely to experience winter storms and extreme cold events which may include snow, freezing rains, and extreme temperature lows. All areas of the county are equally exposed to these types of weather events with somewhat colder temperatures and snowfall frequency in the higher elevations, especially along US Route 431/79. Map 5-28 shows the location of Gunters Mountain in northeast Marshall County which stands at 420 m (1378 ft).

Map 5-28. Gunters Mountain in Marshall County



Extent and Intensity of Potential Winter Storms and Extreme Cold

Winter storms and extreme cold events in Marshall County cause transportation disruptions when they occur due to the inexperience of residents in handling these hazardous conditions, black ice on the roadways and potholes developing due to frozen and cracked roads. Heavy snowfall or icing conditions can cause limbs to fall, roofs to collapse and utility lines to be damaged causing issues with communications and power. These issues can result in loss of life due to structural damage to residences, a lack of access to heat due to utility disruption or vehicular accidents. Water distribution pipes have broken causing water to be shut-off to businesses and residents while repairs are being done. Other issues caused by winter storms and extreme cold events are agricultural damage to crops and livestock resulting in economic damages. Marshall County has a large number of chicken houses

and many of those can sustain losses due to lack of heat because of power outages or structural damage to the chicken houses.

Previous Occurrences of Winter Storms and Extreme Cold

Table 5-10 provides a summary of winter weather events in Marshall County from 2010-2019. Winter events since 1993 can be found in Appendix E. According to NCDC records, every year between 2010 and 2019 there has been at least one snowfall event. The annual amount of snowfall ranged from a low of one-half inch in 2018 to a high of 15.5 inches in 2011. Eight of the ten years had extreme cold events with the lowest windchill for that period of -8° Fahrenheit in 2015.

5-10. Marshall County Winter Events, 2010-2019

Date	Event	Snowfall Amount (inches)	Extreme Low Temperature (°F)
2010	Winter Weather	12.3	
2011	Winter Weather	15.5	
2012	Frost/Freeze		29°
2013	Winter Weather	5.75	
2013	Frost/Freeze		28°
2014	Winter Weather	13.5	
2014	Frost/Freeze		25°
2014	Cold/Wind Chill		-7°
2015	Winter Weather	10.7	
2015	Frost/Freeze		20s
2015	Cold/Wind Chill		-8°
2016	Winter Weather	3	
2016	Frost/Freeze		20s
2017	Winter Weather	1.8	
2017	Frost/Freeze		28°
2018	Winter Weather	0.5	
2018	Frost/Freeze		20s
2018	Cold/Wind Chill		-5°
2019	Winter Weather	1.2	
2019	Frost/Freeze		20s

NCDC, 2020

In February 2015 there were two winter weather events less than a week apart. Snowfall, up to 10 inches in some parts of Northern Alabama, and icy conditions caused road damage that made transportation difficult in some parts of the county even after the snow was gone. Schools in Marshall County were closed for the week of February 16 – 20, 2015 and there were other school closings on December 8, 2017 and January 16, 2018. On January 15, 2018, the governor declared a winter weather related state of emergency. Travel is dangerous at times for school buses because some of the

roadways are not pre-treated before a winter storm and so schools either delay opening, or they cancel school for the day.

The largest snowfall recorded in Marshall County occurred in the winter of 1963-1964 with 24.0 inches of snow for the season. The most damaging winter storm in Alabama history was in March 1993 with damages totaling $5.0 billion dollars. This event is commonly referred to as the "Blizzard of '93," which had severe impacts throughout the eastern U.S., affecting 26 states and parts of Canada. The storm began on Friday March 12, 1993, and lasted through mid-day Saturday, March 13, 1993. By mid-day Saturday, snow had accumulated to 6 - 12 inches over North Alabama. An estimated 400,000 homes were without electricity, and many remained so for several days. Compounding the snow and power problems, temperatures fell well into the single digits and teens across much of the state Saturday night. There were at least 14 deaths associated with the storm. The entire state was declared a Federal Disaster Area.

Probability of Future Winter Storm and Extreme Cold Events

Winter storms and extreme cold events will continue to impact Marshall County on an annual basis to some extent. Historical records cannot determine future outcomes as the frequency of these events is unpredictable. Past severe winter events have caused major transportation disruptions, lengthy power outages, substantial property damages, agricultural issues, and some loss of life and will continue to do so in future events. Mitigation measures can be implemented to lessen the effects of winter storm events such as better protection of utilities and roadway preparedness, warming shelters for people in need and participation in winter weather exercises. Chapter Six – "Mitigation Strategy" addresses different mitigation measures that can be undertaken to lessen the impact of these hazards.

5.3.6 Droughts

According to previous ADECA Director Jim Byard, "Drought is a slow, silent disaster that can cause water shortages and negatively affect hay, livestock and other industries." Arab Tribune, October 22, 2016.

A drought is an event of prolonged shortages in the water supply, whether atmospheric, surface water or ground water. A drought can last for months or years or may be declared after as few as 15 days. It can have a substantial impact on the ecosystem and agriculture of the affected region and harm to the local economy and increase the risk for wildfires. Periods of heat can significantly worsen drought conditions by hastening evaporation of water vapor. After severe drought, erosion often occurs because when it rains the vegetation has died and will not hold soil.

Agriculture-related disasters and disaster designations are quite common during times of drought. Many counties in the United States have been designated as disaster areas in the past several years, even in years of record crop production. Livestock is affected because there is no healthy land to graze on, and farmers are forced to use hay that was intended as winter feed.

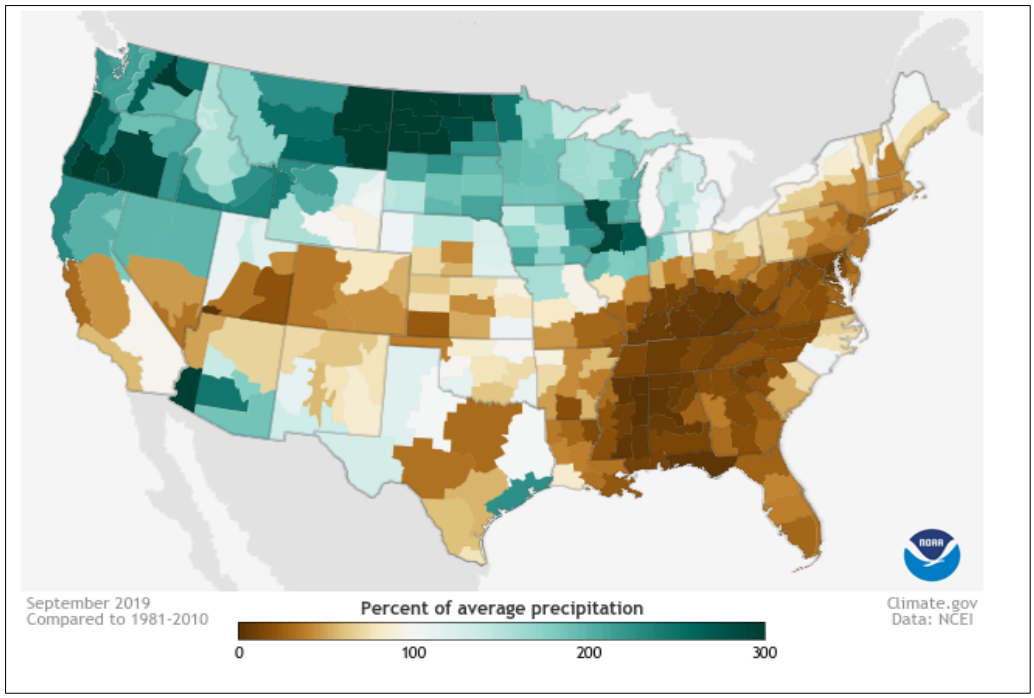
A drought phenomenon known as a "flash drought" occurred in September 2019. The September flash drought impacted all of the southeastern states. Generally, droughts are caused by a lack of precipitation over an extended period of time. In contrast, a flash drought is preceded not just

by a lack of rain, but also very high temperatures and/or extensive number of sunny days. Even if the dry period is not especially severe, the very high temperatures combined with the abundance of sunny days can pull moisture from the ground quickly. NOAA National Weather Service's Climate Prediction Center defines a flash drought as "an event during which an area experiences degradation by two or more drought categories in a four-week period, based on the U.S. Drought Monitor." Table 5-11 delineates drought classifications as outlined by the US Drought Monitor and Map 5-29 shows the areas impacted by the flash drought of September 2019.

Table 5-11. US Drought Monitor Classifications

Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought:
		Short-term dryness slowing planting, growth of crops or pastures
		Coming out of drought:
		Some lingering water deficits
		Pastures or crops not fully recovered
D1	Moderate Drought	Some damage to crops, pastures
		Streams, reservoirs, or wells low, some water shortages developing or imminent
		Voluntary water-use restrictions requested
D2	Severe Drought	Crop or pasture losses likely
		Water shortages common
		Water restrictions imposed
Category	**Description**	**Possible Impacts**
D3	Extreme Drought	Major crop/pasture losses
		Widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses
		Shortages of water in reservoirs, streams, and wells creating water emergencies

Map 5-29. Areas Impacted by the Flash Drought of September 2019



Precipitation anomalies represented as a percent of average precipitation for the United States during September 2019. Brown areas refer to areas with below-average amounts of precipitation while green-blue represents areas with above-average monthly precipitation. During September, record-breaking dryness enveloped the southeastern United States stretching into the Tennessee and Ohio Valleys. A flash drought occurred as a result. Climate.gov image using data from the National Centers for Environmental Information (NCEI).

Location of Potential Droughts

Droughts occur countywide, affecting all Marshall County jurisdictions equally. Some areas may be more susceptible to the ill-effects of drought such as agricultural areas and areas with vulnerable water supplies. During 2016, 2017, and 2019 Marshall County was included in the Secretarial Disaster Designations by the Secretary of Agriculture. By designating a county as either a primary or contiguous disaster county, emergency loans can be made available to the agricultural producers suffering losses. Other emergency assistance programs have used the designations to trigger eligibility for their disaster assistance programs such as the Farm Service Agency disaster assistance program.

Extent and Intensity of Potential Droughts

Drought in Marshall County causes problems for the agriculture industry and has led to infrastructure issues due to excessively dry ground. The dry ground causes cracks and potholes in roadways which cause transportation issues and the lack of support around water distribution piping can lead to the pipe shifting and breaking causing water disruption. Water shortages due to drought

are possible even though most of the water supply for Marshall County comes from Guntersville Lake. The impact on the livestock and crops can be devastating both economically and to the animals. The dry vegetation is a perfect condition for wildfires to spread very quickly.

Previous Occurrences of Potential Droughts

The flash drought of September 2019 was a significant event. Throughout the summer, temperatures were slightly warmer than average and summer precipitation across much of the Gulf was slightly below average. At the same time, rainfall amounts along the Mississippi and Missouri Rivers into the Tennessee Valley were much higher than average. Then, due to a lack of rain from tropical storms and hurricanes, Alabama saw its temperatures soar and record the driest September in the last 125 years.

On October 22, 2016, a drought emergency was declared due to a review of current and anticipated conditions and reported impacts, including rainfall, streamflow, reservoir and ground water levels, little rainfall, above normal temperatures, and falling reservoir and ground water levels. This drought continued until May of 2017. The winter months of November, December and January of that time were exceptionally dry – the driest of any months between January 2015 and December 2019. Water conservation efforts were employed to try to mitigate the effects of the drought.

The most significant drought event in Marshall County occurred in 2007. With drought conditions carrying over from 2006, by late spring of 2007 the drought moved up to a D4 Exceptional Drought intensity, the highest intensity, which is characterized by widespread crop and pasture losses, wildfires, and severe shortages of water resources in reservoirs, streams, and wells. This drought was so severe and widespread that it affected almost the entire southeastern United States. Drought conditions continued through the end of 2008. As a result of this extended period of drought, crop yields were disappointing, livestock suffered because ponds and wells dried up, trees became brittle and weak causing them to snap more easily during storms, lake and river levels fell leaving boats stranded on land and making waterways throughout the South impassable. Lawns across the county dried up and died as water restrictions were put into place. The Exceptional Drought intensity rating persisted throughout 2008 until being lifted on December 16.

Probability of Future Drought Events

All of Marshall County is susceptible to drought and therefore is a legitimate issue for Marshall County that is likely to occur in the future. Drought can occur anytime of the year, as can be seen by the severely dry months of November - December 2016, and January 2017. While there is no way to prevent a drought from occurring, certain measures can be taken to better prepare the citizens for such events. Public awareness and planning efforts, especially in relation to water resources, are vital to lessen the impact of drought. Chapter Six – “Mitigation Strategy” addresses different mitigation measures that can be undertaken to address drought and its impact.

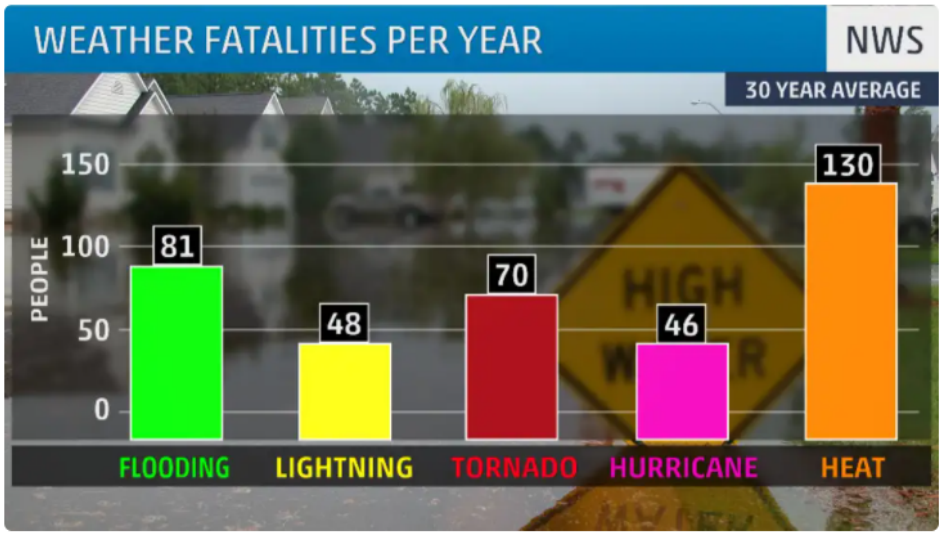
5.3.7 Extreme Heat

Extreme heat is when there are 2 or more consecutive days with temperatures of 10°F or more above the average during the summer months. For some regions, temperatures above 90°F with high

levels of humidity and a high heat index constitute extreme heat conditions. Heat waves are extended periods of extreme heat.

The number one weather related killer from 1986-2015 in the United States, according to NOAA, was extreme heat. As shown on Chart 5-3, the 30-year average for extreme heat related deaths was 130 per year followed by a rate of 81 deaths per year for flooding. That is a 60% difference in deaths between the two hazards.

Chart 5-3. Weather Fatalities Per Year, US



Heat has caused the most deaths on an annual basis during the last 30 years (1986-2015). (NOAA)

Extreme heat impacts buildings, roads, and infrastructure, along with people, animals, and plants. In cities the buildings, roads and infrastructure can be heated to 50° - 90° hotter than the surrounding air. The excessive heat can lead to drought conditions and the extremely dry vegetation can contribute to wide spreading wildfires.

Location of Potential Extreme Heat

Extreme heat events cover the entire county.

Extent and Intensity of Potential Extreme Heat

Extreme heat is very dangerous for people and animals. It also impacts plants, buildings, and infrastructure. Excessive heat is dependent on location and a person's acclimation to the heat. According to Michael N. Sawka, Ph.D., a physiologist with Georgia Tech, "When temperatures become dangerous varies wildly, based on an individual's acclimation to the climate, dress, exertion level and whether any pre-existing conditions, such as heart disease, are present." Many of the school buses within Marshall County do not have air conditioning systems which present issues for the students traveling during extreme heat events.

Heat Indexes are used to determine the risk of extreme heat events. The heat index is what the temperature feels like to the human body when relative humidity is combined with the air

temperature. Table 5-12 shows classification of risk by the Heat Index and its effect on the body. Heat indexes of 90°F and above are dangerous with heat indexes of 103°F and higher extremely dangerous.

Table 5-12 . Heat Index

Classification	Heat Index	Effect on the body
Caution	80°F - 90°F	Fatigue possible with prolonged exposure and/or physical activity
Extreme Caution	90°F - 103°F	Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
Danger	103°F - 124°F	Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity
Extreme Danger	125°F or higher	Heat stroke highly likely

Effects on the agriculture industry within Marshall County, involve crops, livestock, and chicken houses. Since there is no cooling off period at nighttime during extreme heat events, the crops that rely on cooler nighttime temperatures in order to thrive are negatively impacted. The livestock also require the opportunity to cool off at night and when they are unable to adequately lower their body temperatures, they produce less milk, have slower growth, and have reduced reproduction rates. The poultry in the chicken houses can also be greatly impacted from the heat if the cooling mechanisms in place fail. Some chicken houses can hold up to 20,000 chickens and if they are not kept at an acceptable temperature, they will perish.

The increased demand for electricity during times of high heat cause stress on the electric grid. This stress can lead to brownouts or blackouts. Also, the increased temperature can affect the transmission line's efficiency. These issues can greatly impact critical facilities, the elderly and those who are electricity dependent for special needs.

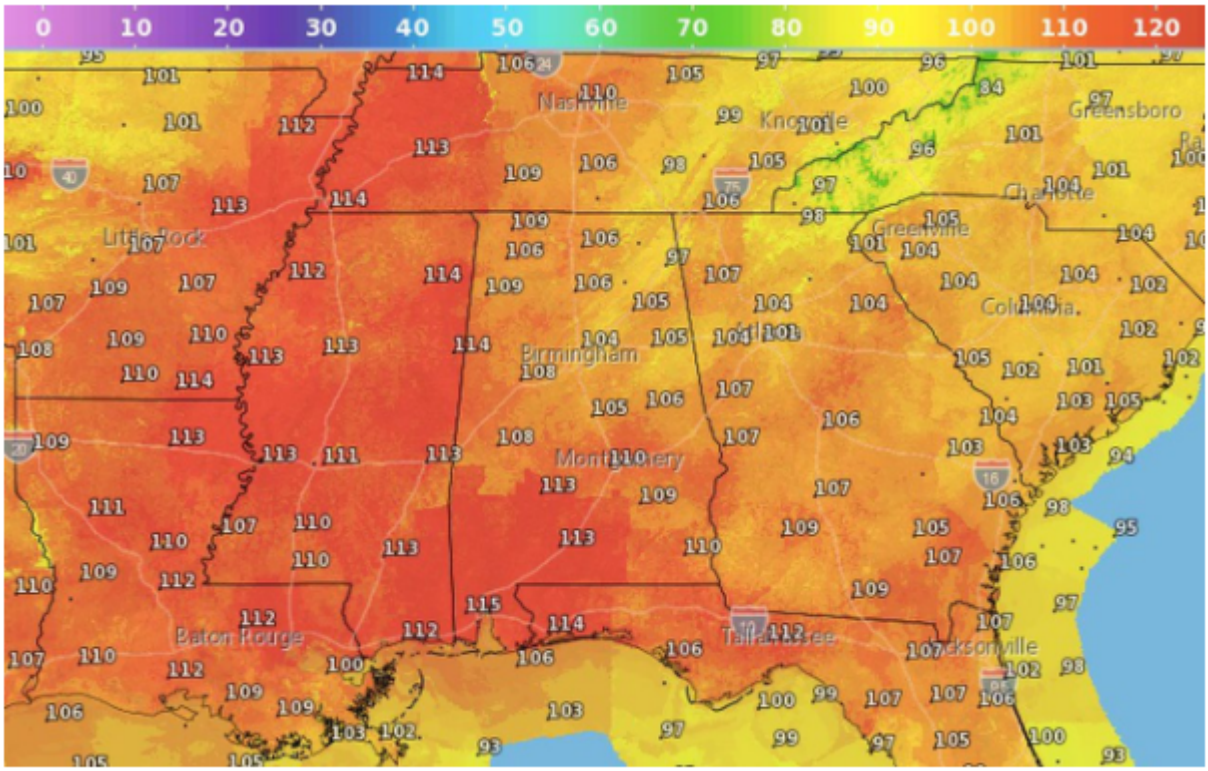
Transportation is impacted by extreme heat because, depending on the products used in the construction of the roadways, the roads can "melt" causing them to become soft and sticky. When this happens, vehicles have a greater difficulty in gaining traction to stop, resulting in cars skidding. The railways also encounter structural issues. During times of excessive heat, the rails can expand and distort. If the trains do not reduce their speeds to accommodate for such changes, the trains can wreck. Marshall County has a record of transportation related accidents involving hazardous materials as mentioned in Section 5.3.14 - Technological Hazards and therefore, the communities should prepare for such events.

Previous Occurrences of Potential Extreme Heat Events

In June 2015 there was an extreme heat event. Between June 15 and June 24, there was a heat wave that resulted in a heat advisory being issued on June 23, 2015. Cooling centers were opened throughout the county to accommodate those who required a place to go during the heat wave.

On August 13, 2019, the heat index reached 105°F in Marshall County. Map 5-30 shows the heat indexes for the southeast on August 13.

Map 5-30. Heat Indexes for August 13, 2019, Southeastern US



Source: Al.com

Probability of Future Extreme Heat Events

All of Marshall County is susceptible to heat waves. According to the National Climatic Data Center, "scientists know that atmospheric moisture plays an important role in heat waves. They tend to occur more frequently in dry conditions with low humidity, but heat waves in high humidity can take their toll on the population, livestock, and wildlife." Mitigation measures can be implemented to lessen the effects of extreme heat events such as activating cooling centers, ensuring proper functioning of utilities, and public awareness campaigns. Chapter Six – "Mitigation Strategy" addresses different mitigation measures that can be undertaken to lessen the impact of extreme heat events.

5.3.8 Wildfires

The two primary categories of wildfires experienced in Marshall County are wildland fires and interface fires. The National Wildfire Coordinating Group (NWCG) defines wildland fire as including both wildfire and prescribed fire, "where wildfire is an unplanned, unwanted wildland fire, and prescribed fire is any fire intentionally ignited by management actions to meet specific objectives." Wildland fires are fueled exclusively by natural vegetation. Marshall County has vast forested lands, grass lands, and brush which can fuel wildfires.

Interface fires are fueled by both vegetation and the built-up environment. Due to the current growth in Marshall County, many families are pushing urbanization into rural landscapes. This is known as the wildland-urban interface. With this urban-to-rural movement comes the increased risk of human-caused wildfires.

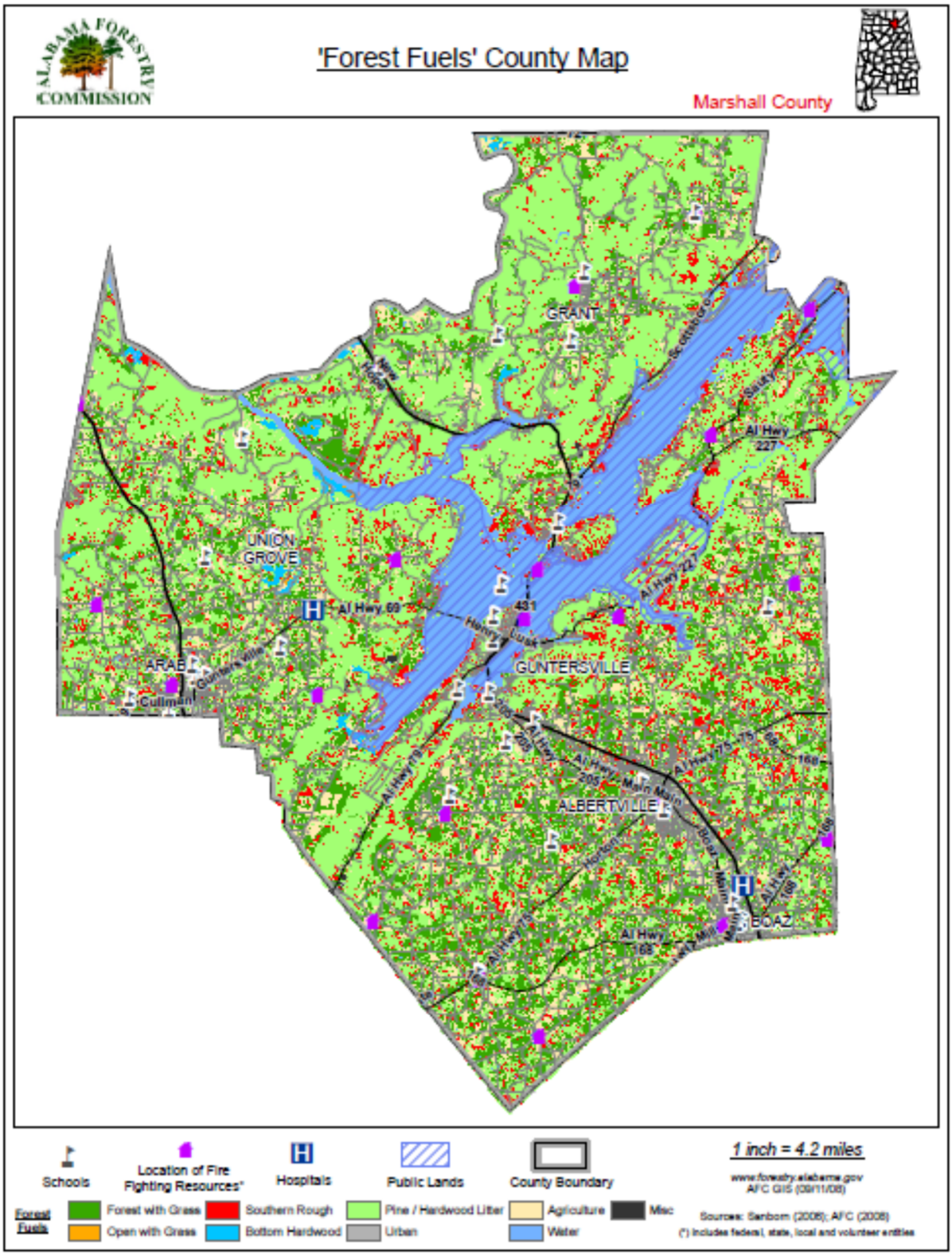
In order to curb the occurrence and effects of wildfires, prescribed burns and other forms of forest fuel control are implemented. Without the practice of prescribed burns, thinning, mowing, and the use of herbicides, vegetation that can spread fires can proliferate causing more of a threat with the additional fuel sources for wildfires.

Fires in Marshall County are often the result of lightning strikes or human-caused negligence and many occur during times of drought. A major problem in relation to wildfires is non-permitted burns. The people setting these fires are ill-equipped to handle the fire as it gets larger and the fire gets out of control and widespread damage occurs. Occasional fires are started by live electrical wires that were downed during a storm. The state implements burn bans during times of high fire risk which make it illegal to set fire to forest, grass, woods, wildlands, marshes; build a campfire or bonfire; burn trash, debris, or other materials and includes no forestry directed open burns or prescribed burns.

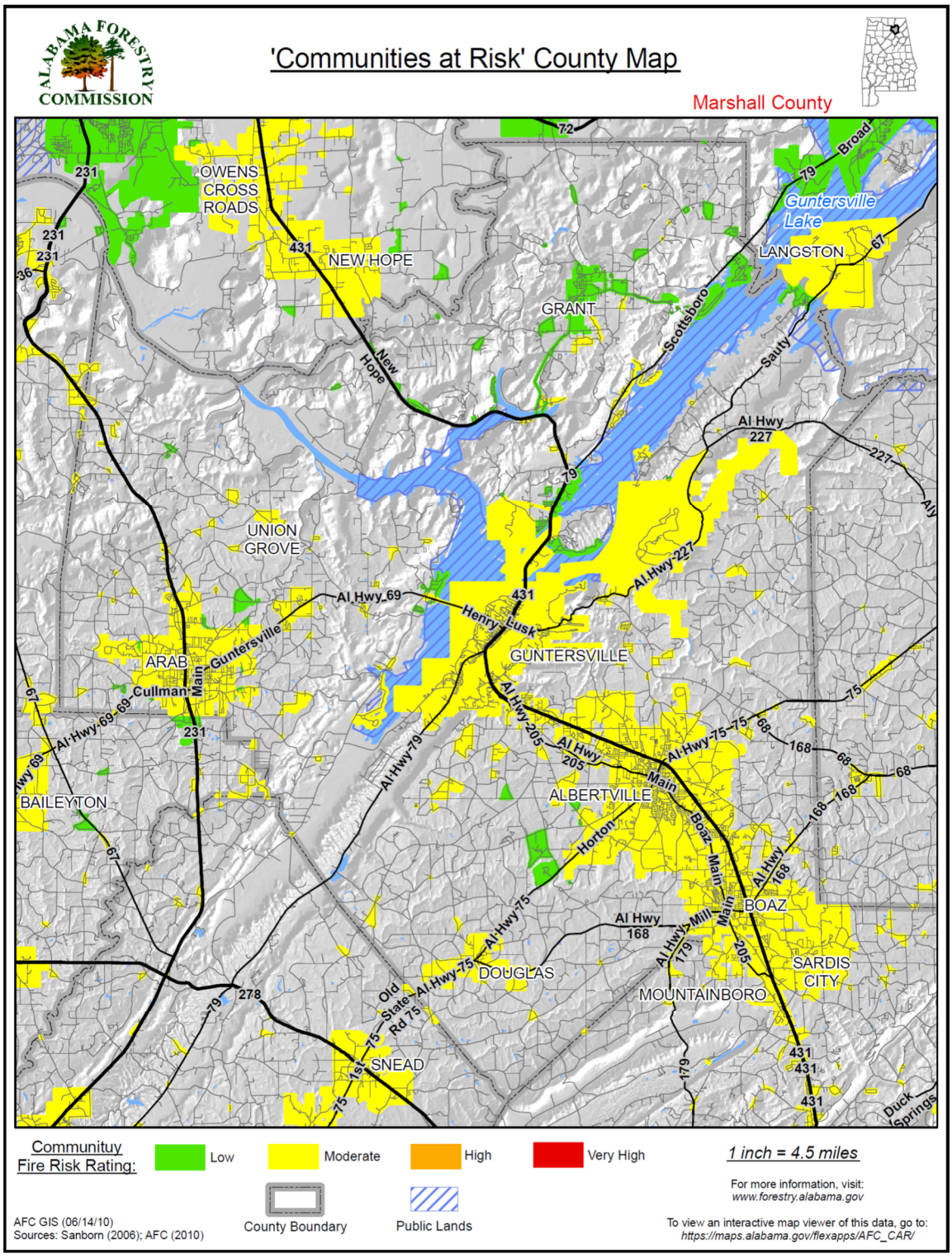
Location of Potential Wildfires

Rural areas of unincorporated Marshall County are the most likely areas to encounter wildfires; however, wildfires can occur in any area where there is the proper fuel, topography, and weather mix. Map 5-31 "Marshall County Forest Fuels" shows the extensive coverage of forest fuels throughout the county, as well as developed urban areas in close proximity to the forest fuels. The vulnerable wildland-urban interface makes all cities and towns equally at risk. Map 5-32 "Communities at Risk," denotes areas throughout the county at various risk levels for wildfires.

Map 5-31. Marshall County Forest Fuels



Map 5-32. Communities Fire Risk



Extent and Intensity of Potential Wildfires

Marshall County has ample wild fuel sources with 142,000 acres of forestland and is prone to drought and thunderstorms which increase the potential intensity of wildfires significantly because dry vegetation is likely to catch fire and spread quickly when struck by lightning.

Another factor that has a direct impact on wildfire formation and increases the risk for wildfires in Marshall County is topography. Topography can have a powerful influence on wildfire behavior. Slope, canyons, gulches, and hollows can greatly increase the rate of spread and hamper access for those agencies that would seek to put out a wildfire. These slopes lend themselves to rapid spreading fires due to their angle. The greater the slope, the faster the flames move and the longer the flames endure. Wildfires can reach into overhanging canopies, allowing spread not only through the lower areas of the forest, but the ability to spread to other trees. According to the local Alabama Forestry Commission office, the terrain is extremely rough over parts of Marshall County, making suppression efforts extremely difficult and time consuming.

Areas that would be considered urban due to their development can have a high potential for effects from wildfires when they border undeveloped areas and forests. This would include the edges of the cities and towns throughout Marshall County.

Firefighting resources can impact the intensity of wildfires. Rural fire departments, which are the groups that operate where the fires are most likely to occur, are almost exclusively made up of volunteers and usually have limited resources that are stretched during periods when numerous fires occur. These limited firefighting resources can compound the risk and extent of wildfire damages.

Past Occurrences of Wildfires

There were 1,195 wildfires in Alabama that burned over 14,000 acres during the severe drought of October 2016. On October 5 there was a fire warning issued due to the drought, lack of precipitation, high probability of fuel ignition, shortage of manpower and resources, and low humidity. This warning was well-warranted.

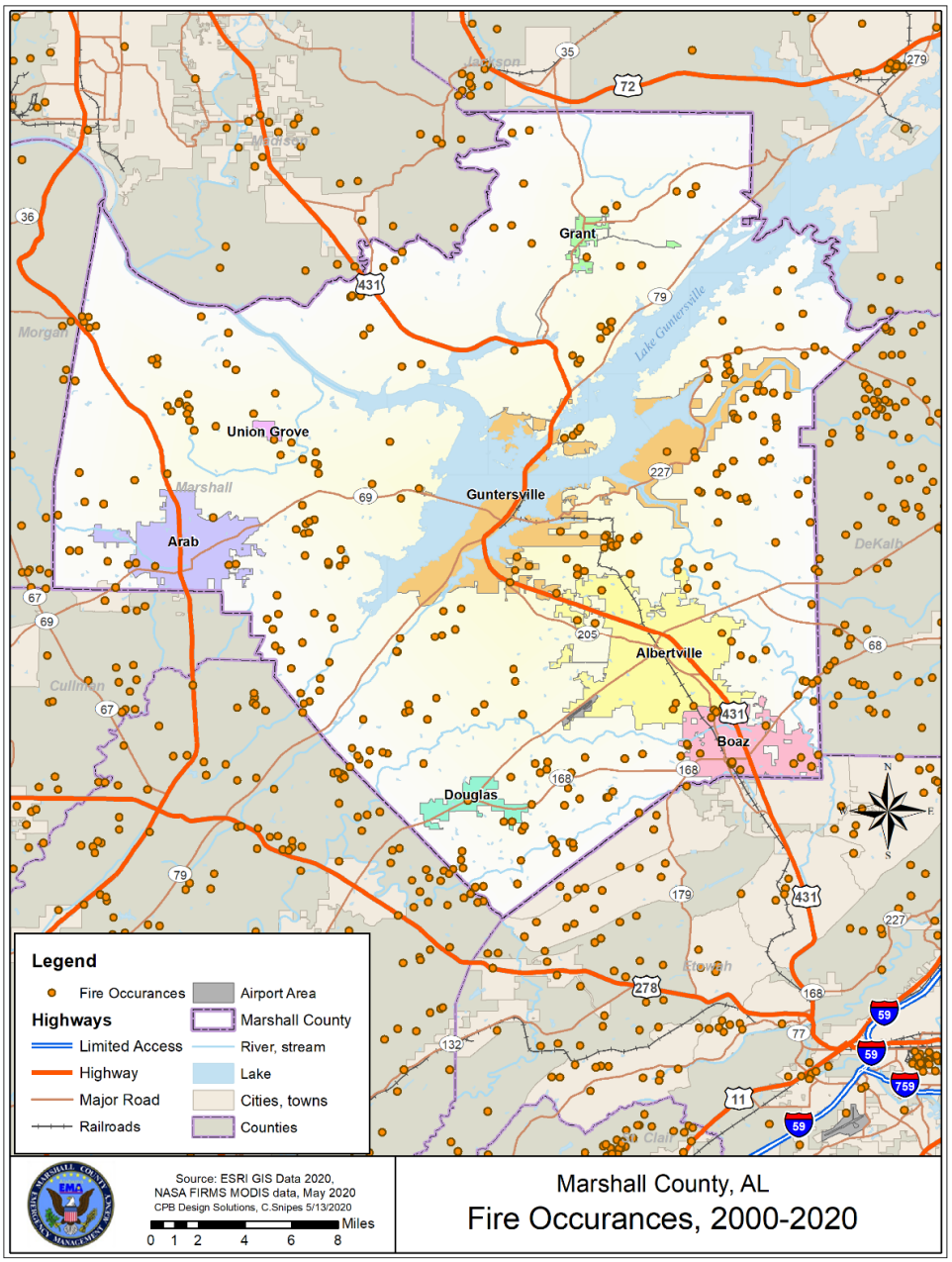
In Marshall County, on October 10, 2016, there were 26 outdoor fires in Albertville over 7 days due to burning brush fires. It took over 17 hours to get the fires under control with the aid of the State Forestry Commission. It was reported that 40 acres of debris from the 2011 tornado helped fuel the fires. On October 18, there was a farm and field fire on Grant Mountain which required 8 volunteer fire departments to contain. Approximately 150 acres were involved in that fire. On October 27 there was a fire in Union Grove that burned over 55 acres. By the end of 2016, there had been 3,644 wildfires and about 50,000 acres burned in Alabama with 68 of those in Marshall County.

According to the Alabama Forestry Commission, Marshall County experienced 221 wildfires which consumed a total of 2,270 acres between January 2000 and December 2019. The average of 4.9 fires a year between 2000 and 2009 has increased significantly to an average of 17.2 fires between 2010 and 2019. It is believed that the increase was due to the unusual number of fires between September 24, 2016 and November 28, 2016. The county ranks 45th among 67 Alabama counties for

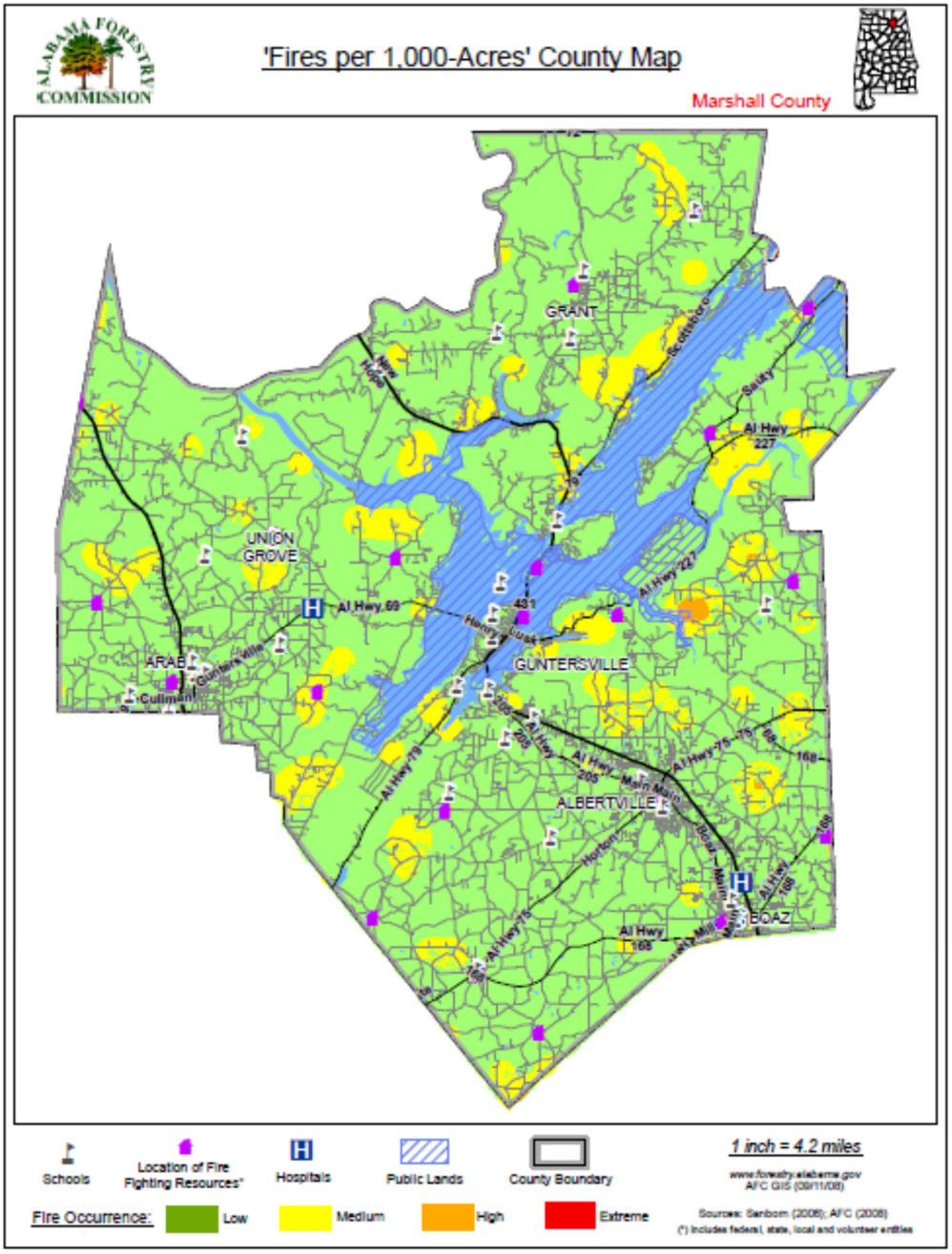
number of fires and 52nd for acres burned. Most of the reported fires occurred during the months of February, March, and April, which are most susceptible to fires.

Map 5-33 "Marshall County Fire Observations" shows the location of wildfire occurrences over the 2000 to January 2020 period. These are generally random locations. Map 5-34 "Marshall County Fires per 1,000 Acres" shows areas at various levels of wildfire occurrences from low to extreme. These wildfire occurrence areas generally coincide with areas denoted as moderate-to- high-risk areas as seen on Map 5-32 "Communities at Risk."

Map 5-33. Marshall County Fire Occurrences



Map 5-34. Marshall County Fires per 1,000 Acres



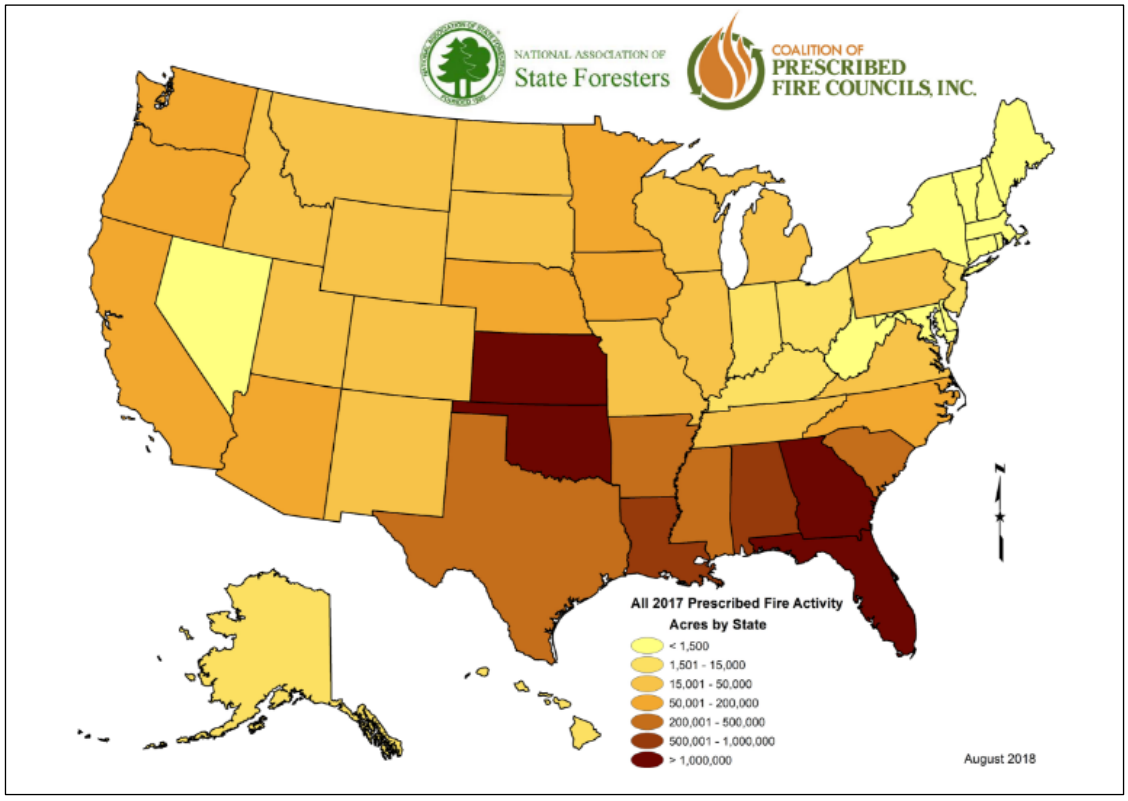
The weather is a natural contributor to wildfire occurrences. Extremely dry weather creates the perfect conditions for woodlands ready to spread fire rapidly. Droughts increase the flammability of vegetation and enhance difficulty in suppressing fires. In addition to drought, lightning can strike woodlands setting them on fire, and trees that had been downed through severe weather events can add to the vegetative fuels to make timber for fires as well as make fighting the fires more difficult for firefighters by restricting access to some areas. Another impact on the spread of wildfires is the lack of tending to the fallen trees after clearing an area for timber.

Probability of Future Wildfire Events

Based on historical information, Marshall County can expect an average of eleven significant wildfires per year that damage or destroy an average of 113 acres. Although one can extract data and probability of occurrence from historical information, the risk of a wildfire occurring, and the location of damage appear to be random.

Alabama, under the direction of the Alabama Forestry Commission, is in the top ten states that perform prescribed burns which tend to lower the amount of wildfire spread. Also, the county has concentrated their efforts on education of the public and improved training and resources for the volunteer fire departments around the county. Map 5-35 shows the state of Alabama's efforts with prescribed burns compared to the rest of the country for 2017.

Map 5-35. Prescribed Fire Activity, 2017



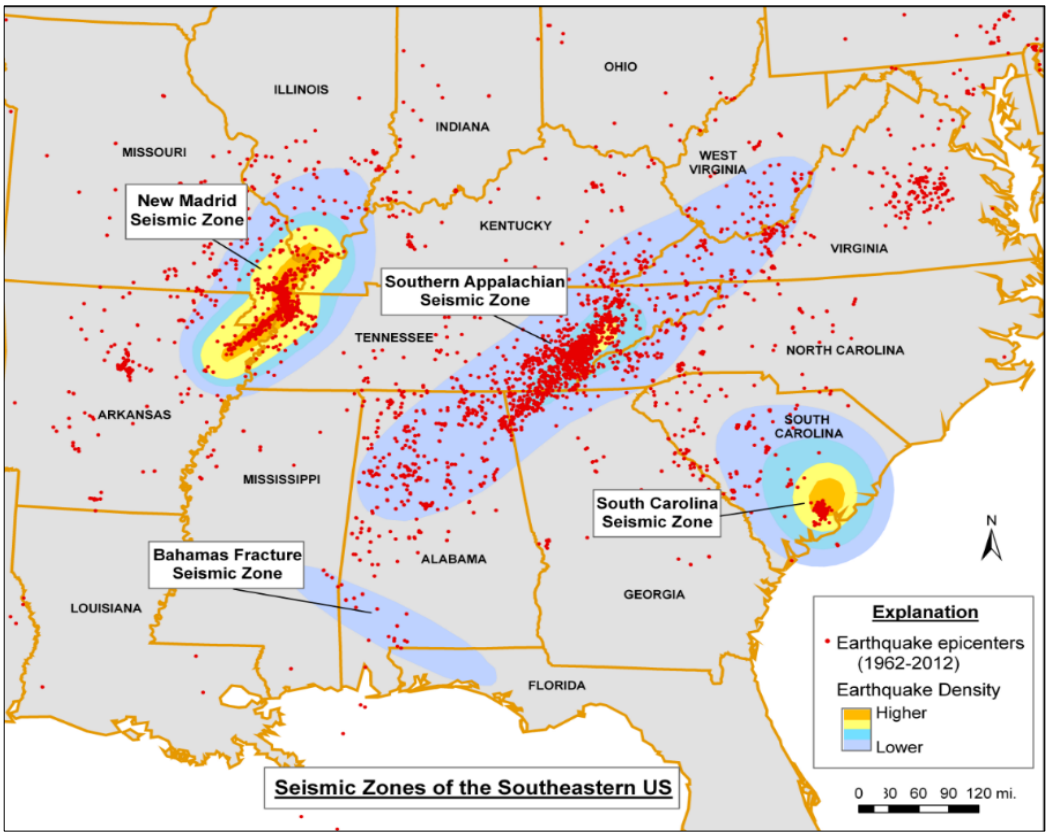
As long as the county continues to conduct prescribed burns and educate their citizens about wildfires, the number of fires and spread should remain at a reasonable level. Also, if legislation can be enacted to require timber companies to burn off remaining debris from timber removal, the county should continue to see less intense wildfires. Another measure that can be taken to minimize the impact of wildfires, is for citizens to allow the county to aid in the removal of fallen trees and debris from storm damage throughout the county after storm events, especially in large debris fields. Chapter Six – "Mitigation Strategy" addresses these mitigation measures and more that can be undertaken to lessen the impact of wildfires.

5.3.9 Earthquakes

Earthquakes occur when Sections of the earth slip past each other. The surface above the slippage is the fault. The area below the surface where the earthquake starts is the hypocenter and the location directly above the hypocenter on the surface of the earth is the epicenter. Associated with earthquakes are foreshocks, mainshocks and aftershocks. Not all earthquakes have foreshocks which are smaller earthquakes that occur before the main earthquake. The largest main earthquake is the mainshock and smaller earthquakes that follow the mainshock are known as aftershocks. Aftershocks always occur and they can last for weeks, months, and even years after the mainshock.

Earthquakes occur around seismic zones; it is where earthquakes tend to focus. Marshall County falls within the Southern Appalachian Seismic Zone. Seismic hazard zones describe the degree of threat to areas within the seismic zone. Typically, the closer to the center of the seismic zone the higher the seismic hazard zone. Marshall County is located in an area of low seismic hazard and has experienced the effects of earthquakes from the Southern Appalachian Seismic Zone. People in northern Marshall County felt the effects of both the 5.1 magnitude Irondale earthquake in 1926 and the 4.9 magnitude Fort Payne Earthquake in 2003. Map 5-36 shows the Seismic Zones and their locations.

Map 5-36. Seismic Zones



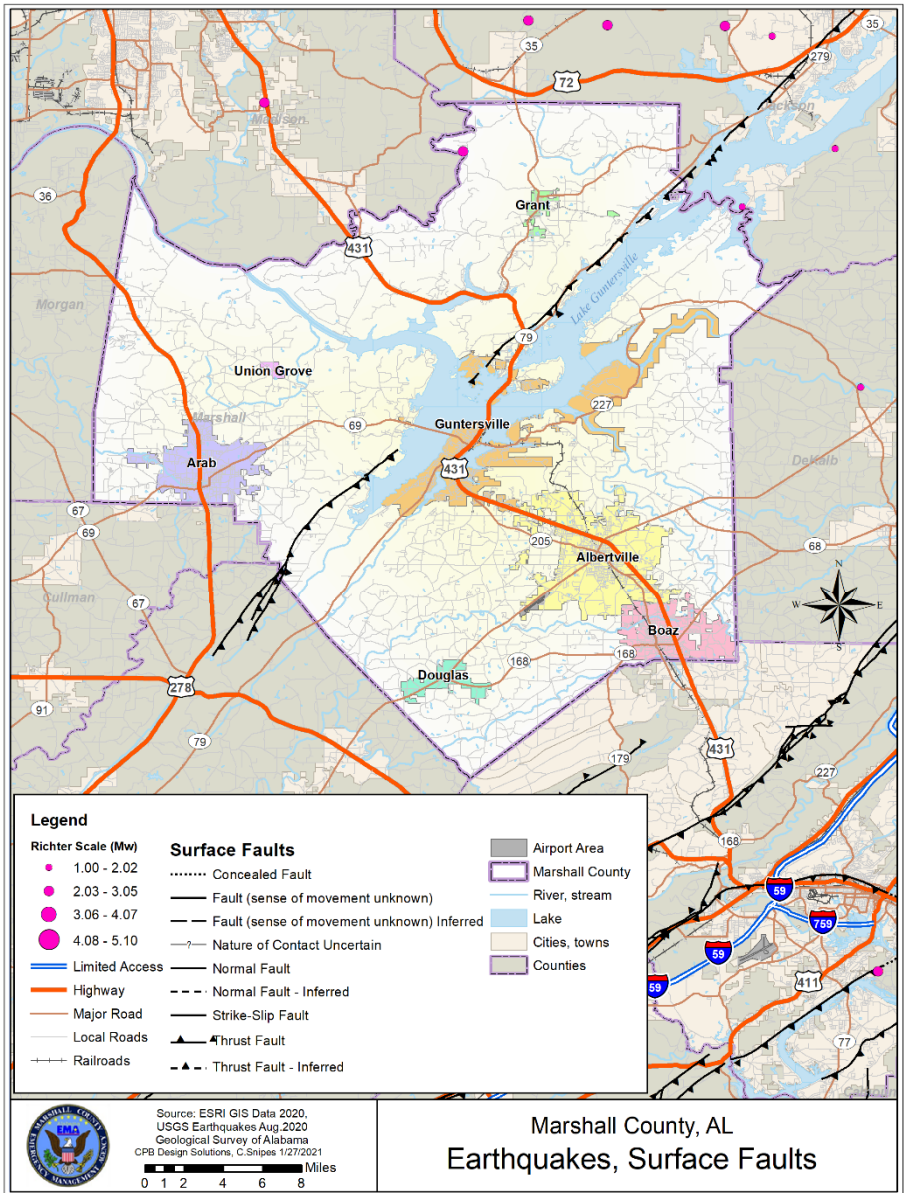
Source: Geological Survey of Alabama

Small earthquakes can occur due to human activity. Those activities include extraction of mining products, ground water or oil. This can cause an earthquake because it will change the stress

on the plates below the surface causing a shift. Another cause is overloading the Earth's surface where there was not a load before, adding stress to faults, such as the impoundment of water behind dams. One more human activity that can cause earthquakes is when fluid that has been extracted from the Earth is injected back into it. The use of disposal wells cause faults to slip due to the wastewater from oil or gas production being forced back into the Earth.

There have been moderate levels of seismic energy released by the Southern Appalachian Seismic Zone (SASZ) for hundreds of years. The area around the SASZ has many old faults that developed during the forming of the Appalachian Mountains; however, no active seismic faults are known to have reached the surface. Map 5-37 shows the location of faults associated with SASZ running through Marshall County.

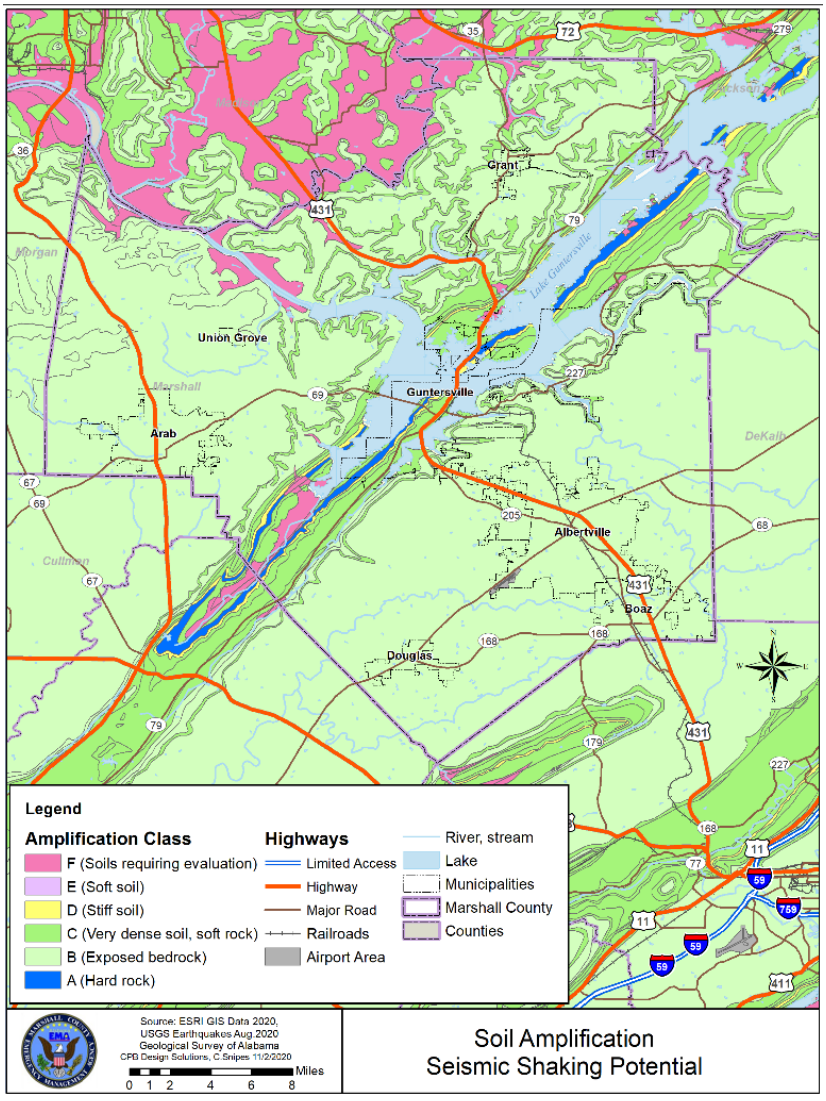
Map 5-37. Surface Faults of Marshall County



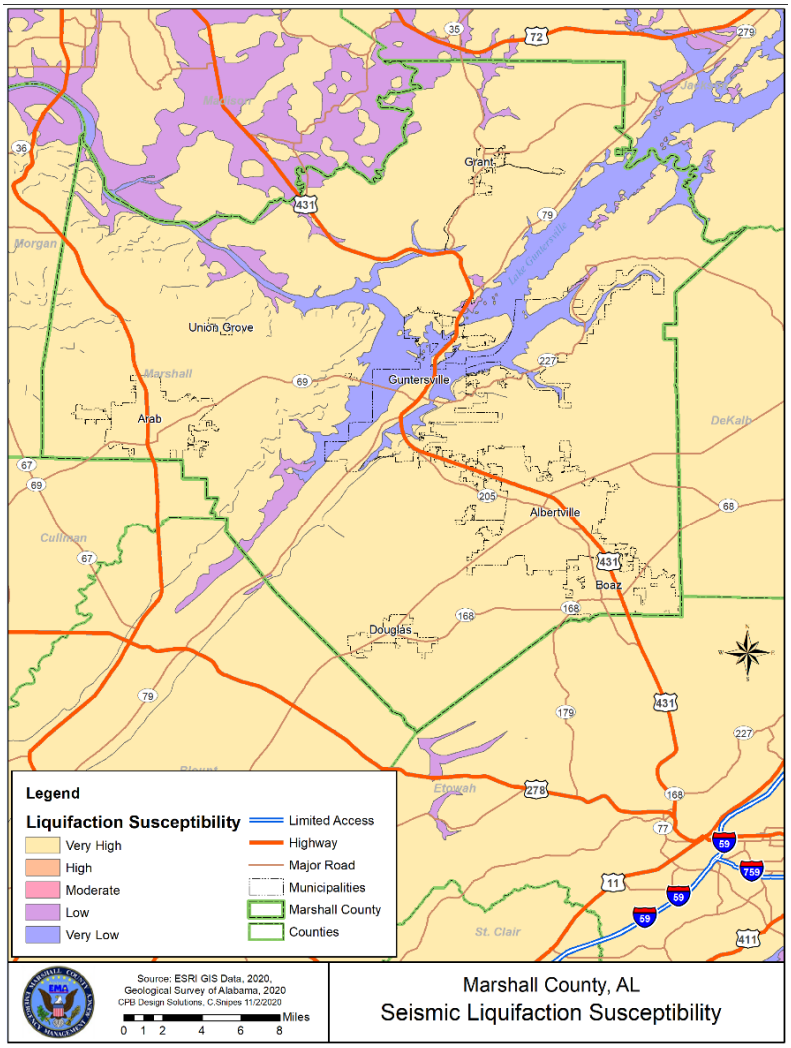
Location of Potential Earthquakes

Since all of Marshall County is located within the Southern Appalachian Seismic Zone, all jurisdictions are susceptible to experience an earthquake. The soils and other geological characteristics contribute to the extent of damages to buildings and infrastructure. For instance, structures built upon loose sediments of riverine floodplains along the Tennessee River and Lake Guntersville are more likely to be damaged than structures built on bedrock in the upper elevations, such as Sand Mountain. Liquefaction is most likely to occur in soils with high water content within parts of these flood plains. Given the natural physical features of Marshall County, ground-shaking potential and seismic liquefaction susceptibility are very low in all developed municipal locations with the exception of Guntersville. Maps 5-38 and 5-39, generated from 2020 GIS data supplied by the Geological Survey of Alabama (GSA), show locational variations in ground shaking and soil liquefaction throughout Marshall County. More information about Earthquakes can be found in Appendix D.

Map 5-38. Earthquake Ground Shaking Potential



Map 5-39. Earthquake Liquefaction Potential



Extent and Intensity of Potential Earthquakes

According to the Geological Survey of Alabama (GSA), recent seismograph records indicate that earthquakes are frequent across the state but are usually small enough that they are not felt, and damage reports of incidents have been relatively minor. One potential effect of earthquakes could be damage to Guntersville Dam which could lead to further impacts. The intensity of the impact of the earthquake will depend on the epicenter location and the magnitude.

The intensity of shaking and observed effects of an earthquake is measured according to the Modified Mercalli Intensity Scale, shown in Table 5-13, and the magnitude is the measure of energy released by the earthquake on a scale of 1 to 12, with a magnitude 7 being felt on land and causing some damage. The State of Alabama Hazard Mitigation Plan indicates that Marshall County is in the top ten of all counties in terms of seismic risk. Most human-caused earthquakes, resulting from fracking or induction of wastewater from oil and gas production, result in a 1-3 on the intensity scale.

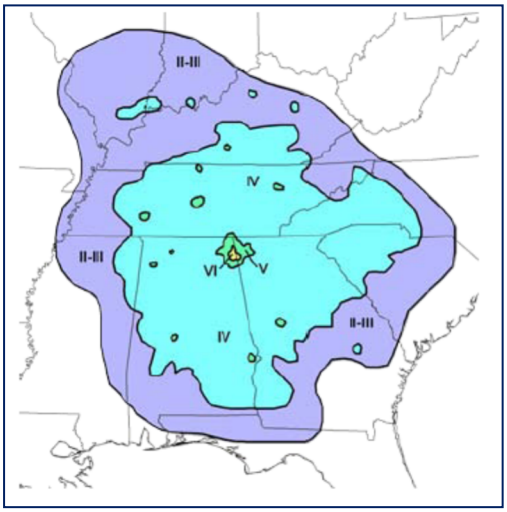
Table 5-13. Modified Mercalli Intensity Scale

Class	Intensity
I	Not felt
II	Felt by persons at rest, on upper floors, or favorably placed.
III	Felt indoors. Vibration like passing of light trucks.
IV	Vibration like passing of heavy trucks.
V	Felt outdoors. Small unstable objects displaced or upset.
VI	Felt by all. Furniture moved. Weak plaster/masonry cracks.
VII	Difficult to stand. Damage to masonry and chimneys.
VIII	Partial collapse of masonry. Frame houses moved.
IX	Masonry seriously damaged or destroyed.
X	Many buildings and bridges destroyed.
XI	Rails bent greatly. Pipeline severely damaged.
XII	Damage nearly total.

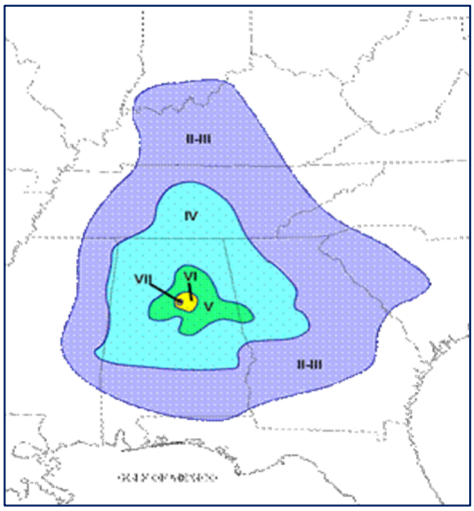
Previous Occurrences of Earthquakes

The most recent earthquake which occurred on Tuesday morning, April 29, 2003, was a 4.9 magnitude earthquake which occurred in the neighboring county of DeKalb. This earthquake was felt in 13 states. Fortunately, the earthquake was deep and consequently did not cause significant structural damages in Fort Payne, the closest major city, nor was there any damage in Marshall County. Map 5-40 "2003 Fort Payne Earthquake" shows the impact of the Fort Payne Earthquake. Map 5-41 "1916 Irondale Earthquake" shows the impact of the 1916 Irondale earthquake on Marshall County, where the measured intensity was between IV and V on the Mercalli Scale, shaking was felt, and some disruption occurred. It was a 5.1 magnitude earthquake.

Map 5-40. 2003 Fort Payne Earthquake

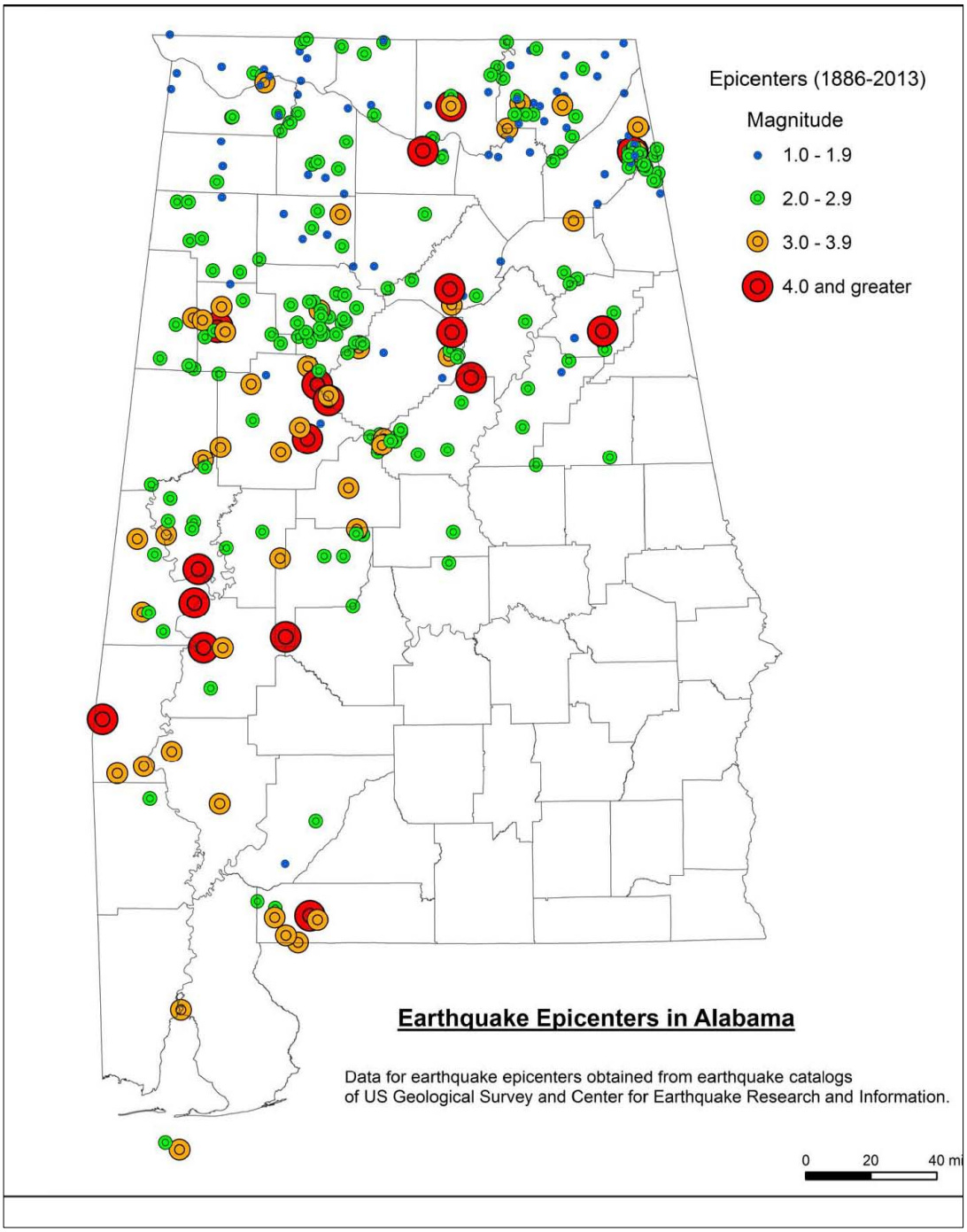


Map 5-41. 1916 Irondale Earthquake



Map 5-42 “Alabama Earthquake Locations” shows the location and magnitude of recorded earthquakes from 1886 through 2013. A few earthquakes with a magnitude greater than 4.0 have been recorded. Only the 1916 Irondale and 2003 Fort Payne earthquake of 2003 measured over 4.0 in magnitude, and only four minor events occurred within Marshall County between 1886 and 2013.

Map 5-42. Alabama Earthquake Locations



Source: Geological Survey of Alabama

Table 5-14 "Historical Earthquakes, 2000-2020" lists earthquakes from 2000 through 2020 for Marshall County and surrounding counties. There have been no recorded earthquakes since 2013 in the Marshall County area.

Table 5-14. Historical Earthquakes, 2000-2020

Date	County of Epicenter	Nearest City or Town	Magnitude
04/21/2000	Blount	Oneonta	2.4
03/12/2001	**Marshall**	**Guntersville**	**2.3**
06/21/2001	Jackson	Stevenson	2.3
09/10/2001	**Marshall**	**Guntersville**	**1.7**
12/07/2001	Jackson	Scottsboro	1.6
12/24/2001	Jackson	Scottsboro	2.4
02/4/2003	Jackson	Scottsboro	1.9
04/29/2003	DeKalb	Fort Payne	4.9
06/22/2003	DeKalb	Mentone	1.9
07/06/2003	DeKalb	Mentone/aftershock	2.4
07/15/2003	DeKalb	Mentone/aftershock	2.5
07/25/2003	DeKalb	Rainsville	2
08/16/2003	DeKalb	Alpine/aftershock	2
06/21/2004	DeKalb	Fort Payne	2.2
11/23/2006	Jackson	Larkinsville	1.8
06/02/2008	Jackson	Dutton	2.2
07/18/2008	Jackson	Francisco	2.3
08/01/2008	Jackson	Lim Rock	2.3
05/03/2009	Jackson	Woodville, AL	2.2

Source: Geological Survey of Alabama & USGS

Probability of Future Earthquake Events

Past records show that earthquakes happen frequently in the area that surrounds Marshall County but rarely occur within the county itself. Furthermore, the earthquakes that do occur in the surrounding counties are generally low enough in intensity that they cannot be felt and do not do much damage, if any, to property within Marshall County. The record of an earthquake over a 5.0 magnitude that was closest to Marshall County is the Irondale earthquake from 1916, the epicenter of which was over 70 miles away.

The Alabama State Plan places Marshall County in the top ten counties that would be financially impacted by an earthquake according to the Hazus analysis run for their plan. According to GSA records and GIS map data, the areas of Marshall County most susceptible to damages from ground shaking and liquefaction are areas of wet soils within the flood plains along the Tennessee River and parts of Lake Guntersville. Damage will only happen in these areas if an earthquake of strong enough magnitude were to occur. The probability of such an event is very low; consequently, all developed areas within the incorporated areas of Marshall County have extremely low risks of earthquake

damages. The results of the Hazard Mitigation Planning Committee hazard ratings and descriptions (refer to Appendix D) supports this same conclusion by giving an average rating for all jurisdictions of "low" for both probability and extents.

Public awareness about earthquakes and how to prepare for them, including securing items within and around homes and businesses, are some mitigation measures that can be taken for Marshall County citizens. Chapter Six – "Mitigation Strategy" addresses different mitigation measures that can be undertaken to lessen the impact of these earthquakes.

5.3.10 Landslides

A landslide is the occurrence when soil or rocks move downward on a slope. The actual slide is generally triggered by an event that could be either natural, such as heavy rain or earthquake, or human-caused, such as construction or mining incidents. Often the land has been compromised by deforestation, erosion or weak bedrock which allows the triggering event to cause the landslide.

Marshall County has vast areas of steep and rugged terrain, with over 200 feet in elevation differences between the low-lying lands along Lake Guntersville and the Tennessee River and surrounding mountain tops. Rugged areas, such as these, are usually susceptible to landslides, which are confirmed by reports of periodic occurrences of landslides over the last 40 years.

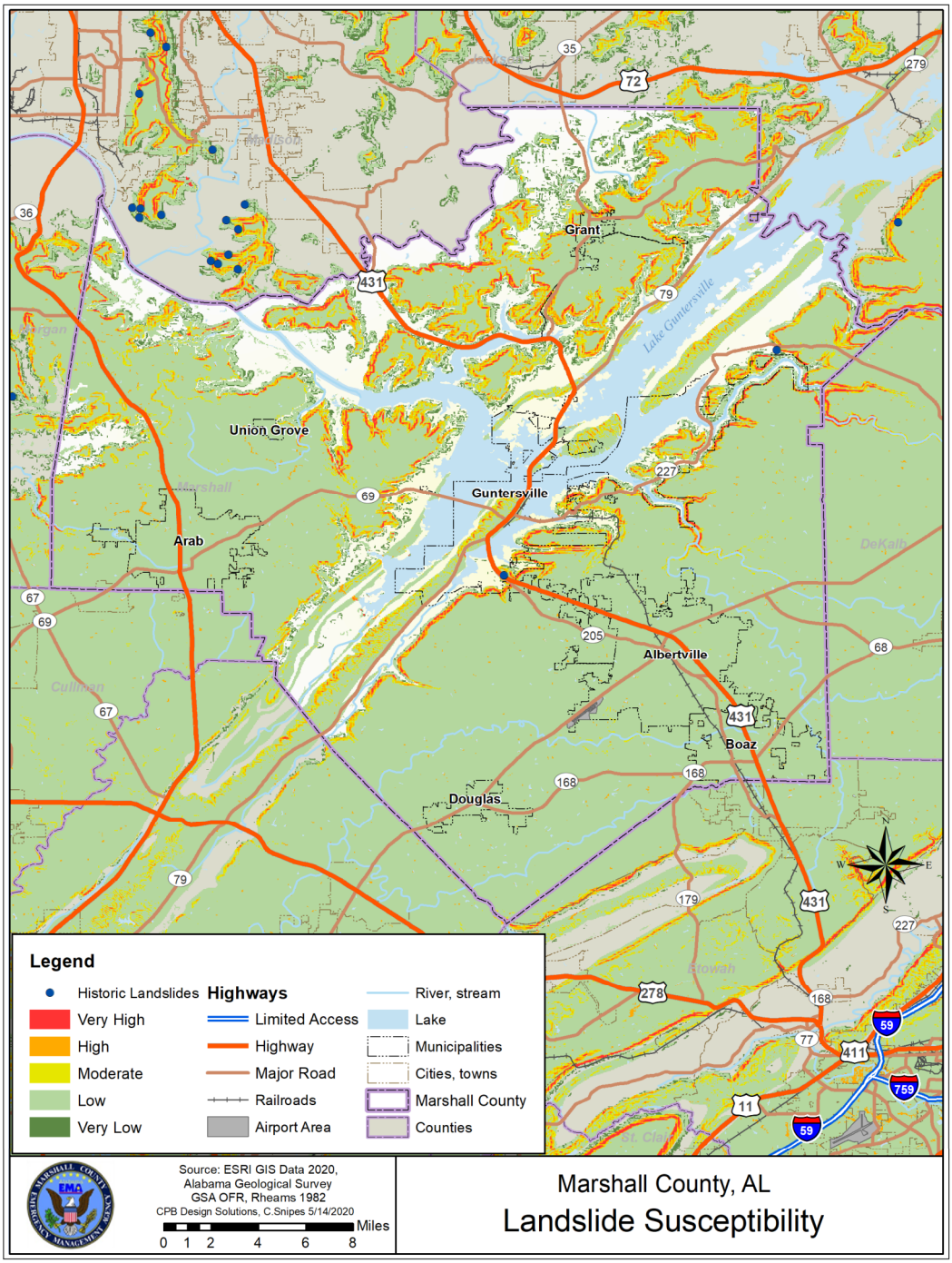
The Geologic Survey of Alabama (GSA) has studied the potential for landslides throughout Alabama. Geographic Information System (GIS) data provided by the GSA for this plan, classifies landslide susceptibility and incidence as follows:

1. Landslide susceptibility. Susceptibility is the probable degree of response to landslide triggers, such as cutting or excavation, loading of slopes, or unusually high rainfall. Generally, unusually high rainfall or changes in existing conditions can initiate landslide movement in areas where rocks and soils have experienced numerous landslides in the past. The potential for landslides is classified into one of the following categories:
   - *High susceptibility* - greater than 15% of a given area is susceptible to land sliding;
   - *Moderate susceptibility* – 1.5% to 15% of a given area is susceptible to land sliding; or
   - *Low susceptibility* – less than 1.5% of a given area is susceptible to land sliding.
   - *Very low susceptibility* - susceptibility is the same as or lower than incidence.
2. Landslide incidence. Landslide incidence is the number of landslides that have occurred. These areas are classified according to the percentage of the area affected by landslides, as follows:
   - *High incidence* - greater than 15% of a given area has previously experienced land sliding;
   - *Medium incidence* - 1.5% to 15% of a given area has previously experienced land sliding; or
   - *Low incidence* – less than 1.5% of a given area has previously experienced land sliding.

Location of Potential Landslides

As shown on Map 5-43 "Landslide Susceptibility," almost the entire county has some degree of susceptibility to landslides, and occurrences appear random. The degrees of susceptibility and incidence vary on the extents of the landslide hazard however, as explained in the next section.

Map 5-43. Landslide Susceptibility



Extent and Intensity of Potential Landslides

According to the GSA data, all of Marshall County is susceptible to landslides. Most of Marshall County is in an area of moderate to high susceptibility to landslides, with the highest susceptibility in the southeast Section of the county, encompassing Albertville, Boaz, Douglas and surrounding unincorporated areas. These same areas, however, have a low incidence. The north and west areas of the county, including Arab, Union Grove, and Grant are moderately susceptible with a moderate incidence of landslides. Most of the City of Guntersville and some areas immediately surrounding Lake Guntersville have low susceptibility and incidence. Damage reports of reported incidents have been relatively minor; however, when they occur along roadways they cause disruptions in transportation.

Previous Occurrences of Landslides



Landslides do not occur very often in Marshall County. Due to flash floods on Christmas Day 2015, a mudslide occurred at a residence near Baker Mountain Road as reported by WHNT news. In Guntersville, Lurleen B. Wallace Drive at Alabama Highway 227 was washed away. Also due to the flooding on Dec 25th, there was a mudslide impacting Aldredge Gap Road and Feemster Gap Road. Since that time Feemster Gap Road has been vacated.

On April 18, 2018 there was a rockslide that occurred due to rain on Highway 227 above Short Creek. There had been a previous mudslide in that area during the flooding event of December 2015. In February 2019, a landslide at Pine Island Point Road resulted in a house being declared structurally unacceptable for occupancy. On March 5, 2019, a twenty-foot ravine was created due to a landslide at Pinelake Drive off Swing Bridge Road which was caused by runoff.

Some notable past landslide events occurred in the 1970's. The Advertiser-Gleam reported that the weekend of April 25-26, 1970, landslides blocked roads, washed away roads, and caused water to be turned off in some areas. In 1977, a landslide affected a water tank and piping, causing $22,000 in damages. On May 13, 1978, the Arab Tribune reported that a landslide occurred on Georgia Mountain shutting down Arab Water until 9:00 Sunday and in April 1979, $1,000 in damages occurred, according to The Advertiser-Gleam.



Source: GSA, 2014

Probability of Future Landslide Events

Although the GSA map data locates the general degrees of risk for landslides in Marshall County, the actual probability relies on a complex combination of variables such as rock type, slope, excavation, hillside development, deforestation, heavy rainfall, or seismic activity. GSA records of landslides have occurred even in areas mapped as "low incidence."

Given the terrain, record of incidents, and the widespread susceptibility of the county to landslides, the probability of future landslide occurrences is certain. According to GSA data, the areas most at risk are atop Sand Mountain - the communities of Albertville, Boaz, Douglas, and surrounding unincorporated communities. The location and annual probability of a landslide, however, are completely unpredictable and could occur anywhere within the county if correct conditions occur. Although landslides could happen at any time all across the county, the frequency and damage potential, based on past records, is low. Consequently, the risk level of landslides is low, relative to other natural hazards affecting Marshall County.

Mitigating slides is very difficult; however, when the conditions for a landslide are evident, proper evaluation of the area should be conducted so precautions can be taken to warn people about the possibility of an impact from the event. Chapter Six – "Mitigation Strategy" addresses different mitigation measures that can be undertaken in regard to landslides.

5.3.11 Sinkholes

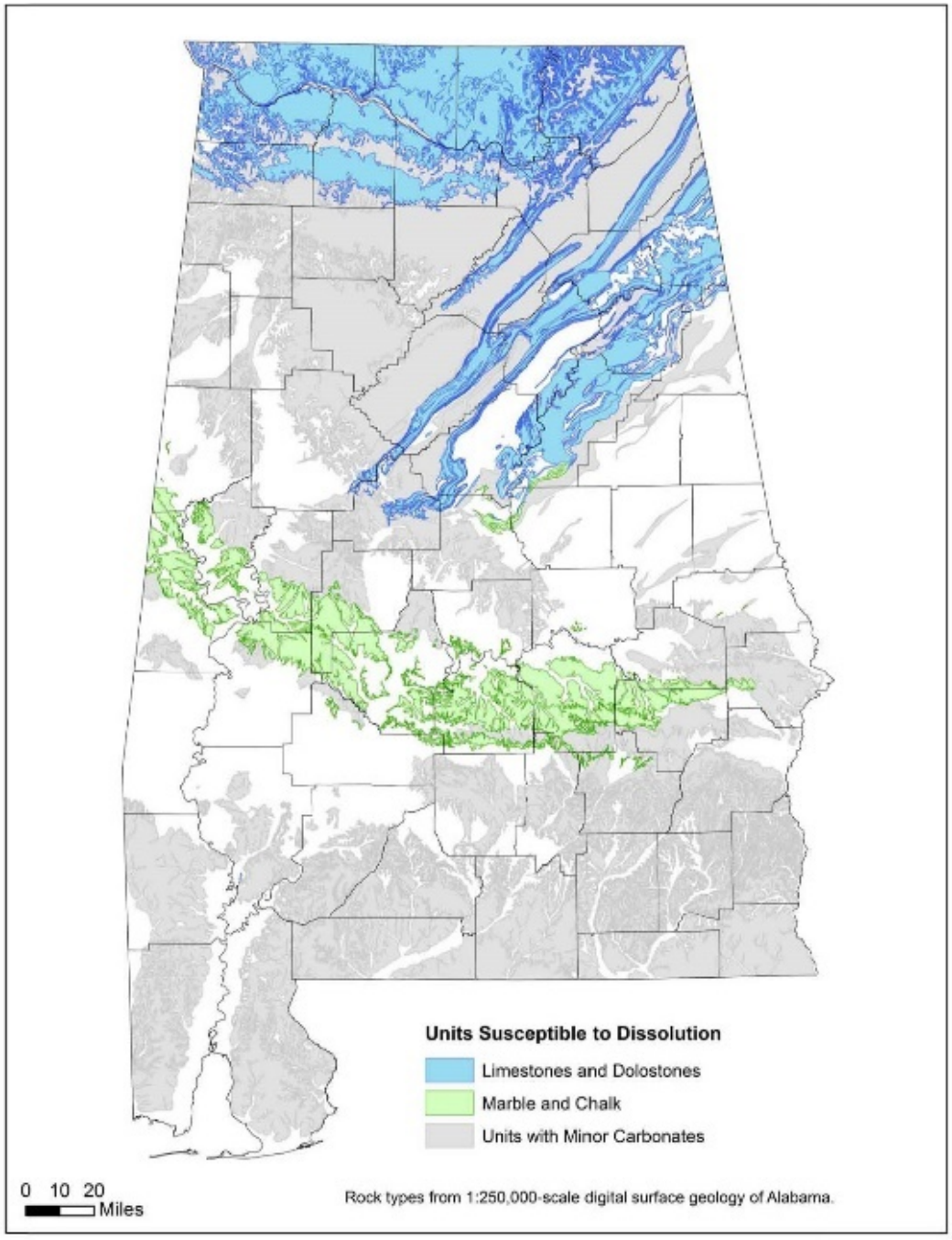
Sinkholes, a form of land subsidence, are the result of water washing away the underground rock causing caverns under the surface and the surface collapsing into the cavern below. One type of rock that is particularly susceptible to being washed away by water is limestone which is the type of rock that much of Marshall County sits upon. When limestone is eroded by water, it forms what is known as karst topography, a combination of caves, underground channels, and a rough and bumpy ground surface. Alabama contains over 2,000 caves because of the karst topography. Map 5-44 depicts karst topography in Alabama and Marshall County.

While most land collapse is caused by the natural process of the dissolving of limestone over time, human activity can also accelerate land collapse. The human activities that may trigger subsidence include mining and the withdrawal of groundwater. Vibrations from machinery, cars, and drilling equipment can exacerbate sinkholes. In addition to human activity, droughts and excessive rainfall can also lead to the formation of sinkholes. During a drought, the groundwater table falls and caves that are normally filled with water may lose the support that the water provided. Eventually, cracks formed during the drought period will cause the roof of the cavity to fail resulting in sinkholes. Building on or near karst areas can be problematic because when ground collapse occurs, buildings and roadways can be damaged, and injuries are possible.

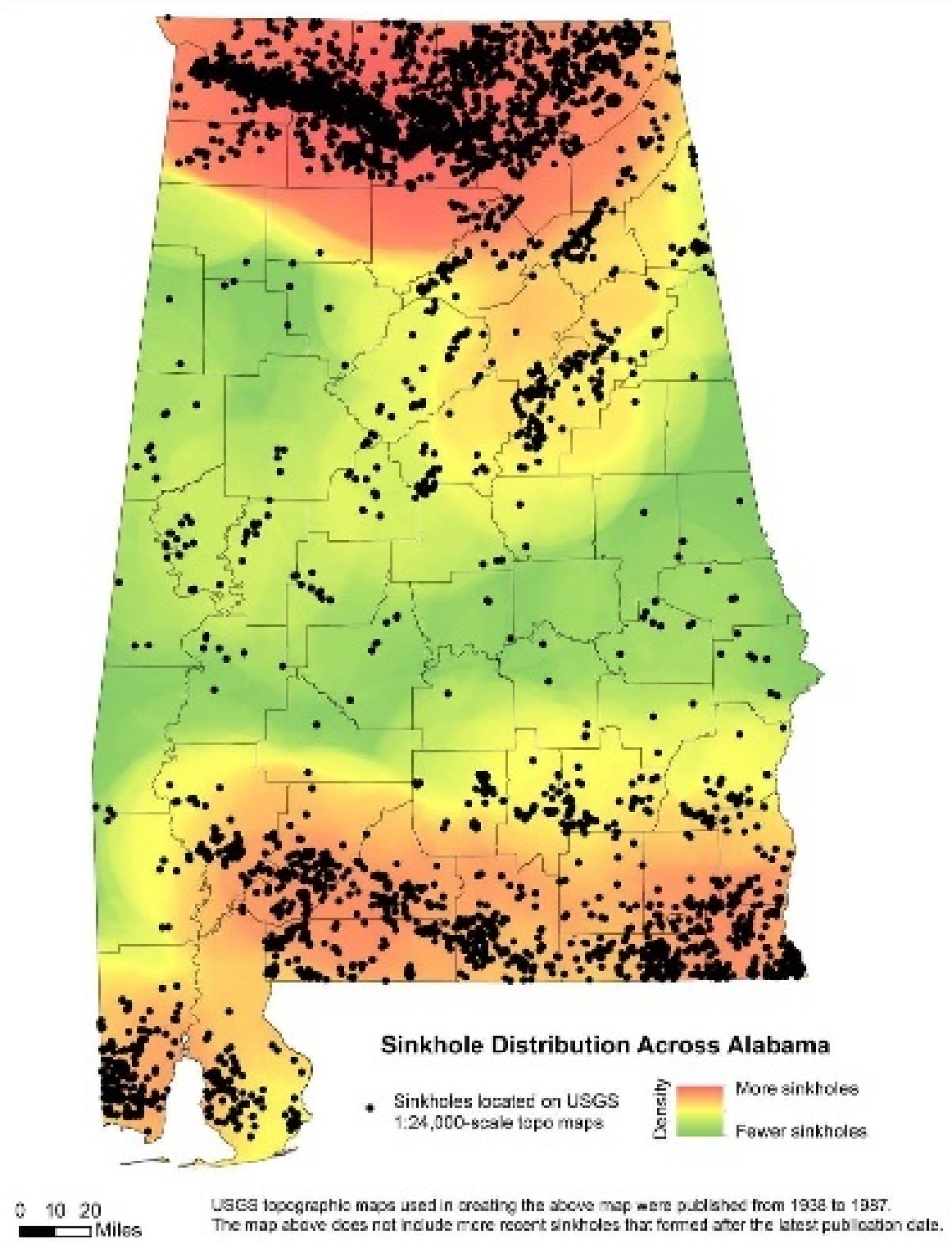
Location of Potential Sinkholes

According to a statewide mapping project of sinkholes completed in 2010 by the Geological Survey of Alabama (GSA), sinkhole development has occurred throughout Alabama, mainly in the northern and southern Sections of the state as shown on Map 5-45. Sinkholes occur in a number of locations in Marshall County, with most developing in the northern half of the county. This part of Marshall County is sparsely developed and therefore there could be sinkholes that have not been mapped. Map 5-46 shows known locations of sinkholes in Marshall County.

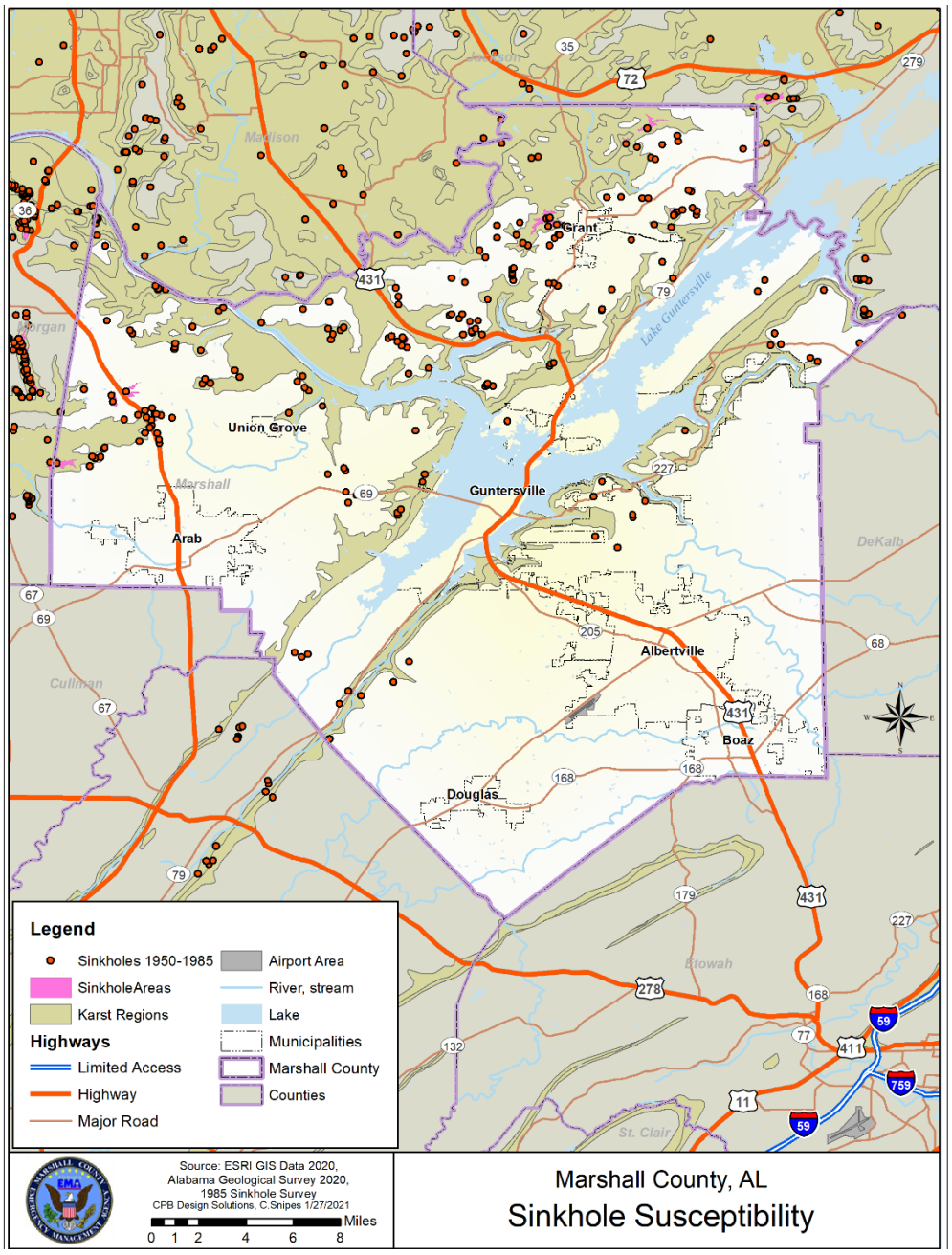
Map 5-44. Karst Geography, Alabama



Map 5-45. Sinkhole Density in Alabama



Map 5-46. Marshall County Sinkhole Susceptibility



Extent and Intensity of Potential Sinkholes

Areas in the northern part of Marshall County are susceptible to the development of sinkholes. Most of the sinkholes that develop do so because of limestone formations or from underground mines. Sinkholes are usually little more than a nuisance when they occur, but they can, on occasion, cause extensive damage to property and infrastructure resulting in loss of property, potential decrease in property value, increased cost on insurance and potential injury. Sinkholes can develop in roadways

causing disruption in transportation. The communities of Grant, Guntersville, and Union Grove are in areas of highest susceptibility due to their location on karst topography.

Previous Occurrences of Sinkholes

The GSA estimates there are over 6,400 sinkholes in Alabama with 178 in Marshall County. There may be more sinkholes in Marshall County; however, there are no regulations requiring individuals to report sinkholes and the northern part of the county is sparsely populated so there may be some yet to be mapped.

Of the available records, several sinkholes have been reported in or in close proximity to Guntersville. The largest sinkhole in the county is in Grant, with other large sinkholes along Highway 231 and around the unincorporated communities of Ruth and Oleander. A well-known sinkhole is located northeast of Guntersville in Bucks Pocket State Park along a trail that leads to Point Rock. Another location of sinkholes, caves and other karst features is the Honeycomb Creek Small Wild Area which covers 274 acres and is a popular whitewater rafting recreation area. It is located along County Road 593 north of Guntersville Lake.

Probability of Future Sinkhole Events

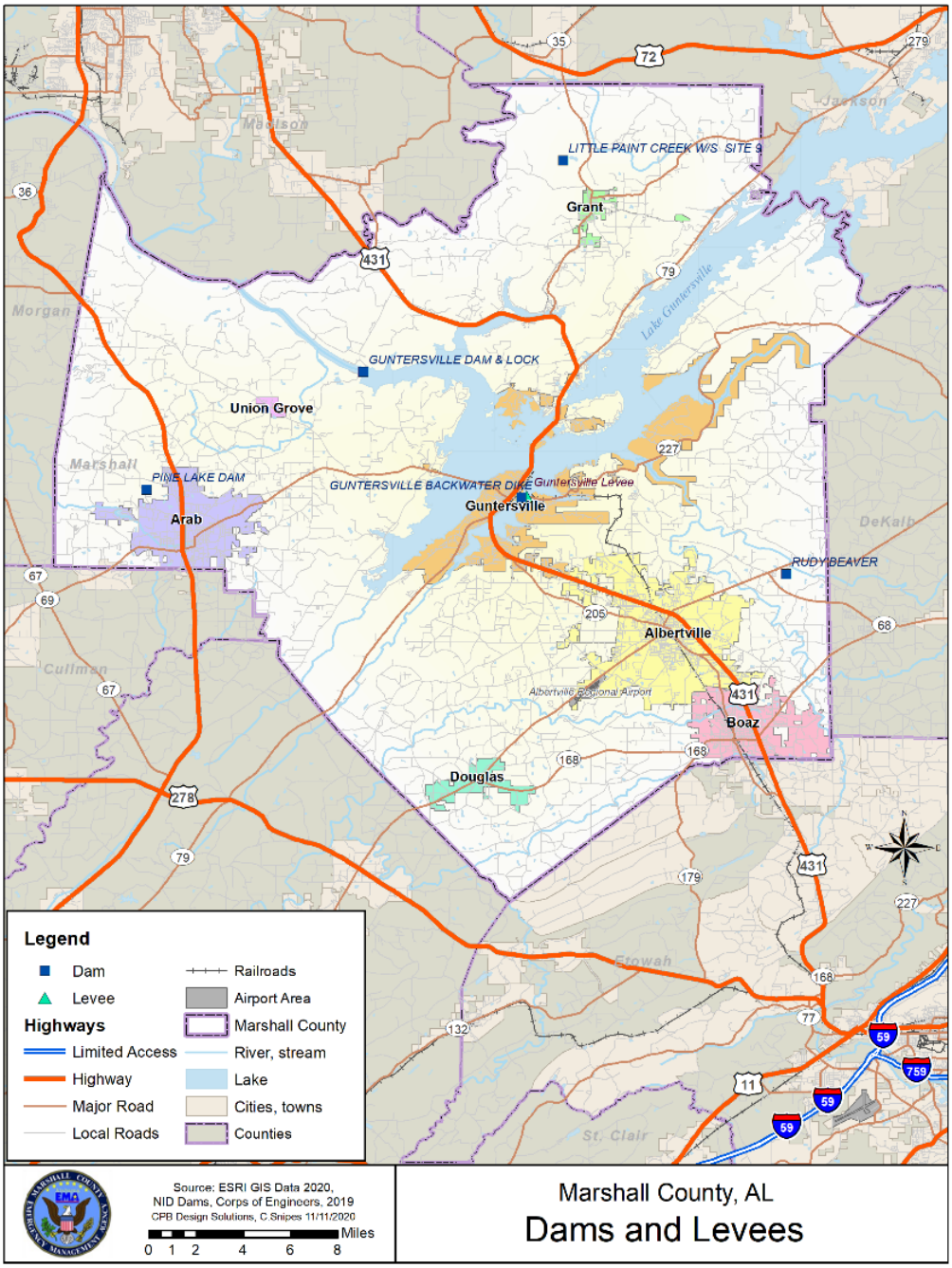
Sinkholes are random events, which can be influenced by both human activity and nature; therefore, the probability of future occurrences cannot be accurately predicted. Because the county has active sinkholes within areas of potential urbanization, the risk of future events will likely remain high although frequency will likely remain low, and past trends will likely continue. According to FEMA insurance reports, the number of sinkholes in the U.S. has steadily increased over the last several decades, and insurance claims for damages as a result of sinkholes have increased dramatically. New data collection efforts by the GSA may help geologists better predict sinkhole activity within Marshall County.

Care must be taken by those involved in activities that can lead to possible land collapse and work toward lessen the impact of such activities. Chapter Six – “Mitigation Strategy” addresses different mitigation measures that can be undertaken to lessen the impact of sinkholes.

5.3.12 Dam and Levee Failures

Dam and levee failures occur when a dam is breached and the impounded water is suddenly released. The resulting damage from a dam breach can far exceed any flood damage in the area. Since a dam failure would most likely occur during times of heavy rain, a failure would exacerbate existing flooding conditions. Marshall County has five dams and one levee within its jurisdiction as shown on Map 5-47. Guntersville Dam, owned and operated by the Tennessee Valley Authority (TVA), creates the Guntersville Reservoir with over 900 miles of shoreline within the County. Although Nickajack Dam is located 70 miles northeast of Guntersville in Tennessee, outside of the borders of Marshall County, it could also have major impact within Marshall County if it fails. Dam and levee failures have the potential to cause significant damage for extended distances because of the force and volume of water; however, dam or levee failures are rare.

Map 5-47. Marshall County Dams and Levees



The Army Corps of Engineers has estimated that the state of Alabama has almost 2,300 dams across the state, but the number is not certain, and neither is the condition of about 98% of the dams because Alabama is the only state in the country that does not have a system in place for dam inspection and safety. There have been attempts to create a program but none of the proposed legislation has passed. The dam safety regulations would establish the protocol for construction, alteration, repair, operation, abandonment, and removal of dams to be administered by a licensed

engineer. The program would operate within the Alabama Department of Economic and Community Affairs (ADECA) Office of Water Resources.

Location of Potential Dams and Levee Failures

As shown on Map 5-46 "Marshall County Dams and Levees," there are five dams and one levee located within the county. The Guntersville Dam is the largest of the five and is also considered a high-hazard dam. This classification is not an indicator of the dam's soundness and quality of construction but rather the potential damage a failure would cause. The high hazard dam rating indicates that if it fails it will likely cause loss of human life. Marshall County could also suffer damage from the failure of the Nickajack Dam located on the Tennessee River which runs through Marshall County and feeds Guntersville Lake. Both of these dams are owned by the Tennessee Valley Authority (TVA) and have emergency action plans. The other four dams are earthen, and two are located on private property. The first two dams would not cause significant damage if failure occurred. The other two earthen dams which create reservoirs, could cause damage to surrounding properties if they failed. One is located near Grant in the northern Section of the county. It helps form Woodland Lake and is maintained by the Marshall County Commission. The other is within the City of Arab. It is located at Pine Lake Village and is maintained by the City. Both Woodland Lake and Pine Lake Village lake are recreational lakes.

Guntersville Dam is the largest dam within the County. It stretches across the Tennessee River to create the Guntersville Reservoir. The Guntersville Dam was completed in 1939 by the TVA and is still owned and maintained by the TVA. It is 94 feet high and stretches 3,979 feet across the river. The dam provides 949 miles of shoreline and 67,900 acres of water surface within Marshall County. This shoreline provides most of the County's recreation including 1 State park, 3 County parks, 8 municipal parks, 4 State wildlife centers, 30 public access areas and 23 commercial recreation areas. The summer net dependable capacity of Guntersville Dam is 123 megawatts of electricity. Nickajack Dam, located outside of the county, could also cause substantial property damage if failure occurred. It is located upstream in Marion County, Tennessee. Nickajack Dam was completed in 1967 and is operated by the Tennessee Valley Authority and is maintained by the Army Corps of Engineers. It is 81 feet high and stretches 3,767 feet across the Tennessee River. It is also a hydroelectric dam which has a summer net

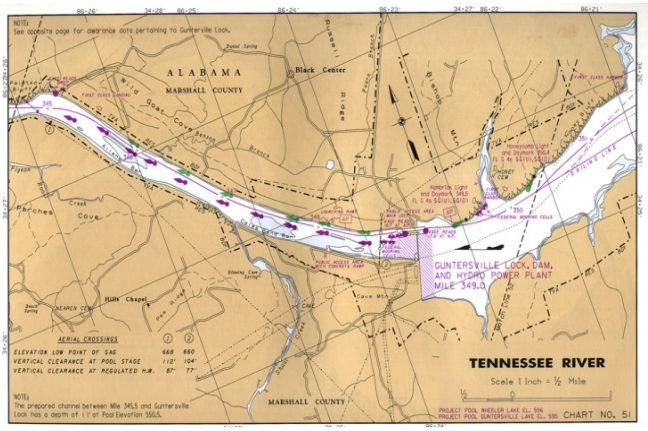


Figure 5-1. Guntersville Dam Plan Details

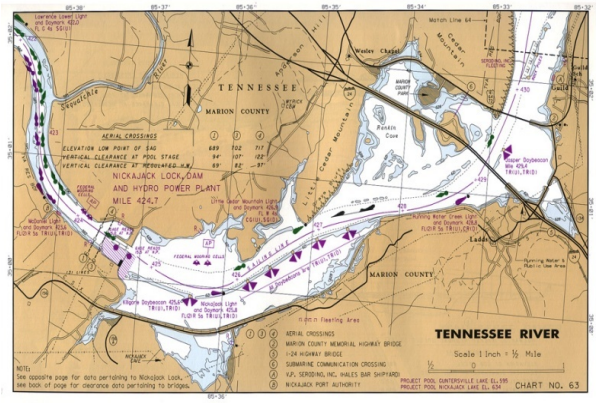


Figure 5-2. Nickajack Dam Plan Details

dependable capacity of 107 megawatts of electricity. The Nickajack Dam provides 179 miles of shoreline and 10,370 acres of water surface.

There is one levee located within Marshall County. The levee is located in the City of Guntersville along the Guntersville Reservoir. It is in the downtown area and is utilized as a walking trail. The City of Guntersville maintains it, and the TVA monitors the water level.

Extent and Intensity of Potential Dam or Levee Failure

Marshall County could experience significant damages if either of the two TVA dams (Guntersville and Nickajack) or the levee were to fail. The Guntersville Reservoir serves as a flood control impoundment with water surface elevations controlled by the dam. A failure of Guntersville Dam would cause flood inundation from Union Grove to along the Madison/Marshall County line along the Tennessee River. Impacts would also occur along the tributaries of the river. The failure of the dam would impact the affected area at 100- and 500-year flood levels.

If the Nickajack Dam failed, the shorelines of Guntersville Reservoir would be impacted from a sudden surge of water. In a failure during a non-flood condition, the limit of downstream impact would occur along the Jackson/Marshall County line south of Deal Creek. Much of the flooding would occur along the tributaries of the Tennessee River and Guntersville Lake. Travel distance from Nickajack Dam to Marshall County is approximately 70 miles. This long distance allows for the timing of the peak flow to be forecasted before impact of flood waters occurs. Consequently, emergency preparedness actions could allow for evacuation and protection of vulnerable properties. Most affected areas are rural and outside of incorporated jurisdictions.

Significant damage to Guntersville could occur if the levee were to incur major damage. The failure of two earthen dams on public property could cause downstream property damages. These public dams include Woodland Lake Dam northwest of the Town of Grant which is maintained by the Marshall County Commission, and the City of Arab's Pine Lake Village Dam within the Arab city limits.

Inundation studies for failure of Guntersville and Nickajack dams have been conducted and are updated from time to time, and emergency plans have been put into place. Inundation studies of the smaller dams and levees within Marshall County have not been completed.

Previous Occurrences of Dam and Levee Failures

There have been no documented dam or levee failures within Marshall County to date.

Probability of Future Dam or Levee Failure Events

The risks to Marshall County associated with dam or levee failure are minimal. The TVA has emergency action plans in place for Guntersville and Nickajack Dams, which are constantly monitored and inspected for safety. The action plans address failures that could occur under normal conditions, a 100-year flood event, and an extreme flood event. Each plan provides for emergency response guidelines in the event of failure. The TVA plans are kept on file with the Marshall County EMA. Earthen dams maintained by the Marshall County Commission and the City of Arab pose little risk of failure.

Major earthquakes in Marshall County and East Tennessee have some potential to threaten Marshall County dams and Nickajack Dam. Refer to the hazard profile for earthquakes for the probability of these future events. Human-caused incidents can also cause dam failure either in the operation of the dams or in the structural integrity.

The implementation of dam safety programs and regulations, and the constant monitoring of the structural integrity of the dams should aid in mitigating dam failure. Due diligence through proper security for both physical and technological threats must be constant to protect the dams and levee from terrorist actions. Chapter Six – "Mitigation Strategy" addresses different mitigation measures that can be undertaken to mitigate these hazards.

5.3.13 Human-Caused Hazards

The term "human-caused hazards" has different definitions even when one consults FEMA and Department of Homeland Security documentation. For the purposes of this plan, we will use the definition provide by FEMA's Emergency Management Institute (EMI). According to FEMA's EMI, human-caused hazards are defined as "hazards that rise from deliberate, intentional human actions to threaten or harm the well-being of others." These hazards include workplace violence, terrorist acts and cyberterrorism. Unintentional hazards caused by humans are covered in the next section "Technological Hazards".

The official definition for terrorism can be found in 28 Code of Federal Regulations, section 0.85. It defines terrorism as "...the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives." The Federal Bureau of Investigation (FBI) further characterizes terrorism as "either domestic or international, depending on the origin, base, and objectives of the terrorist organization."

For this plan, the following human-caused hazard risks were assessed: biological, chemical, nuclear, and radiological agents; arson or incendiary attack; armed attacks; intentional hazardous materials releases; agriterrorism; and cyberterrorism.

Location of Potential Human-Caused Hazards

Acts of violence, terrorism or cyber security attacks can occur anywhere, at any time, with little to no warning; therefore, the potential for an attack on anyone living in Marshall County is present. While all citizens of Marshall County should be aware of the threat of human-caused hazards, research shows that certain considerations should be made to determine those that are considered at higher risk. Those considerations include areas of international, national, or regional importance, military and civilian government facilities, airports, large cities, and high-profile landmarks. Other factors to consider are large public gatherings such as festivals and parades, water and food supplies including agricultural areas, utilities, financial institutions, and corporate centers. Since terrorists can ship explosives or chemical and biological agents to any location through the mail or other systems, there is no location that is not a potential target.

Extent and Intensity of Potential Human-Caused Hazards

Terrorist attacks can be quite severe, with the potential for widespread damage to property and infrastructure and major loss of life and casualties, within any jurisdiction. Impact of such events are determined by the method of attack, the amount of force applied and the density of population in the area of the attack. Some human-caused events can trigger other hazards such as wildfires, flooding due to destruction of dams or levees, and environmental problems due to contamination by chemical or biological agents.

An active shooter could mean loss of life, and as a large percentage of active shooter situations occur in schools, this loss of life could include children. All areas of the county are equally susceptible to active shooter events. Agriterrorism would result in severe economic damage to the county if it involved the poultry industry since poultry is the number one industry for employment in the county.

The impact of cyber-attacks varies depending on the level of the technological breach and the data that is exposed through the breach. Such a breach could have financial or privacy violation consequences for business, government, and private citizens. Cyber security threats always pose a risk, more so today than ten years ago. Threats include social engineering (via Facebook, Twitter, LinkedIn), advanced persistent threats (gaining access to information in an organization), cloud security breaches, malware, and botnets. Also, now that more organizations are using alternative devices, such as iPads, iPhones, Android and Windows-operating smart phones for work-related purposes, attackers have more opportunity to gain access to confidential information via the Web or through apps.

Previous Human-Caused Hazard Occurrences

With Marshall County being a smaller suburban county with no major metropolitan areas, there have been very few human-caused occurrences. In September 2019, a student from DAR school in Grant was arrested after posting a school shooting threat, and in April 2013 an escaped inmate called in two bomb threats to Marshall County hospitals. A cyber attack believed to have originated in China was perpetrated against the Arab City Schools server.

Probability of Future Human-Caused Hazard Events

Human-caused hazards are very unpredictable. There is very little warning if there is going to be a human-caused event and most often none at all. While there are no major venues for sporting or cultural events, such as stadiums for professional or college football, or large shopping malls which would serve as targets, all areas within Marshall County are at risk for some form of human-caused hazard event. In order to mitigate the threats to either stop or lessen the impact, everyone must be more aware of what is happening around them and take steps to increase security around themselves and others, including with their computers and internet. Mitigation measures that can aid in this are presented in Chapter Six – “Mitigation Strategy”.

5.3.14 Technological Hazards

According to FEMA, the term technological hazards refers to hazards that “originate from technological or industrial accidents, infrastructure failures, or certain human activities. These hazards

cause the loss of life or injury, property damage, social and economic disruption, or environmental degradation, and often come with little to no warning." This plan refers to events that are not intentional such as: chemical spill, industrial accident at a facility, industrial accident during transport, and the failure of supervisory control and data acquisition system or other critical infrastructure component.

Hazardous material accidents, either fixed or in transport, are the main type of human-caused hazard that concerned the Hazard Mitigation Planning Committee (HMPC) members because they are the ones that occur most often, as reported in the hazard identification exercise (see Appendix D "Hazard Ratings and Descriptions") and discussed at committee meetings. The accidents range from manufacturing to storage to transportation of hazardous materials. There have been 16 hazardous materials incidents in Marshall County between 2007 and 2018 (EPA's Toxic Release Inventory, 2018). If a release of hazardous materials occurred in the Tennessee River or Lake Guntersville, it could have far-reaching consequences as the material could contaminate the main water supply for most of Marshall County, and it would kill fish and other wildlife.

Most of the technological hazards in Marshall County have involved chemical spills, propane tanks, organic peroxide, ammonia nitrate, processing materials from chickens, anhydrous ammonia, and carbon monoxide.

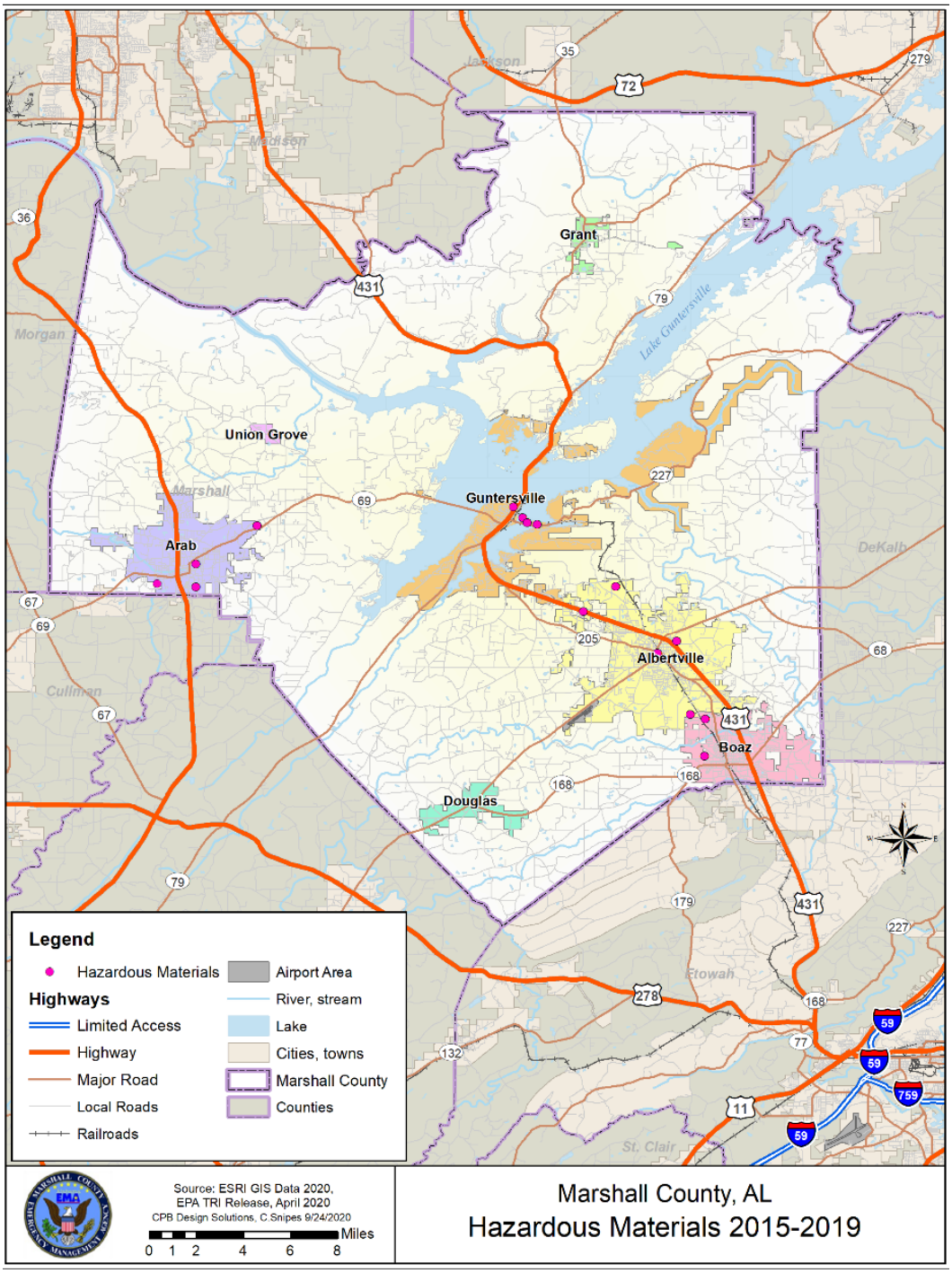
Location of Potential Human-Caused and Technological Hazards

All Marshall County jurisdictions are subject to technological hazards with some being at a greater risk due to their proximity to hazardous material storage sites or major roadways. There are 79 facilities listed in CAMEO. CAMEO is a listing provided by the EPA on places in which hazardous chemicals are stored; however, the listing does not include gasoline stations. These 79 facilities are found throughout the county with most of them located within the main cities of Arab, Albertville, Boaz, and Guntersville, which raises the risk levels for these jurisdictions specifically for hazardous material incidents. Map 5-48 shows the locations of hazardous material storage. These facilities range from the neighborhood hardware store, which might sell fertilizer, to the chemical manufacturing plant, like Umicore located in Arab. Those locations all have the potential to have a spill or accident of some type that could lead to a hazardous chemical release. The materials often have to be transported, whether by train or truck, which presents another opportunity for an incident along the transportation routes.

Extent and Intensity of Potential Human-Caused and Technological Hazards

Marshall County has a varied number of hazardous materials events per year ranging from chemicals released in the air to chemical spills in the water. In 2018, there were 14 EPA reported incidents, but several years prior saw no incidents reported. The events occurred throughout the county with some happening because people deliberately performed an action that released the chemical without regard for its impact on the air and water. Hazardous material events can have effects that range from minor inconvenience, such as the overturning of a gasoline tanker with no spillage, to disastrous, such as a spill into the waterway from a chemical manufacturing plant.

Map 5-48. Hazardous Materials Storage



Previous Technological Hazard Occurrences

The principal technological hazard events that have occurred in Marshall County are hazardous materials accidents. These have occurred at manufacturing sites, storage sites, and even during transport. A number of incidents have occurred during the transport of chicken by-products from processing plants and those are also considered hazardous due to the risk they pose to the health of

people within the area and if the contents of the trucks enter the water supply. Tables 5-15 and 5-16 list the technological hazards that have occurred since 2015.

Table 5-15. Fixed Site Hazardous Material Release

Year of Event	Location or Industry Involved	Materials Release
2015	Welcome Bethel Road	Hazmat release
2016	30336 US Highway 431	Vapor release
	Lake Guntersville State Park	Carbon monoxide
	Cargill	Hydraulic oil into Guntersville Lake
2017	Guntersville Marine	Fuel spill
	ValMonte Marina	Fuel spill
	Americold - Albertville	Anhydrous ammonia release
	District 3	Acid spill
2018	OK Foods	300 gal veg oil
	Cargill	Veg oil into Big Spring Ck
	Cargill	Diesel fuel leak
	Pilgrims Pride Guntersville	Fire and anhydrous ammonia release
	Tyson Foods Alb	Anhydrous ammonia release
	District 1	Pressurized tank explosion
	Wythe Creek	Sewage released into creek
2019	Tyson Foods	268 lbs anhydrous ammonia release

Table 5-16. In Transport Hazardous Material Release

Year of Event	Location or Industry Involved	Materials Release
2015	Hwy 75 Albertville	Chicken by-product spill
	Lake Guntersville	Fuel spill into lake
	1321 Blount Avenue	Diesel spill
	Hussellville Road	Oil spill
	US Hwy 431 Boaz	Chicken by-product spill
	US Hwy 431	Fuel spill
2016	US 431 & Portwood Rd	Chicken by-product spill
	3500 Hwy 277	Fuel spill
	Warrenton Road	Organic peroxide
	Hwy 431 & Edmonson	Fuel spill into sewage system
2017	Districts 3 & 4	Fuel spill
	Hwy 79 & Section Line Rd	Hazmat spill
	District 4	Fuel spill

Year of Event	Location or Industry Involved	Materials Release
	District 1	Fuel spill
	12695 Hwy 168	Fuel spill
	District 1	Hazmat spill
	Martling & Hustleville Rd	Diesel spill release
2018	11080 Union Grove Rd	Diesel spill
	Al 69 & US 431	100 gal diesel spill
2019	Hwy 227 & Blount Ave	Chicken by-product spill
	Penske Terminal- Boaz	50-60 gal diesel spill
	Hwy 75 & US 431	Chicken by-product spill
	Red Mill Area	Hazmat spill into Scarham Creek

Probability of Future Technological Hazard Events

Technological hazards are very unpredictable. There is no way to determine if there is going to be a technological hazard at any certain time and all times of year and locations are at risk for these hazards. Care must be taken by those involved with handling, storing, and transporting hazardous materials. Since Marshall County is susceptible to tornadoes and earthquakes, special effort must be taken to secure all chemicals in the event of these hazards occurring. Chapter Six – "Mitigation Strategy" addresses different mitigation measures that can be undertaken to lessen the impact of these technological hazards.

5.3.15 Pandemic and Infectious Diseases

A pandemic is a disease that affects or attacks the population covering a wide geographical area, including several countries, and/or continent(s). Pandemics typically cause sudden, pervasive illness in all age groups on a global scale. The exact size and extent of an infected population is dependent upon how easily the illness is spread, the mode of transmission and the amount of contact between infected and uninfected individuals.

Infectious diseases are also highly contagious and are spread person-to-person, but can also be spread by animals and insects, depending on the disease. A person can also get some diseases by ingesting contaminated food or water, or by exposure to organisms in the environment. The transmission rate of infectious disease will depend on the mode of transmission of a given illness. A commonly occurring infectious disease, Influenza, also known as the flu, is a contagious illness that is caused by the influenza virus and most commonly attacks the respiratory tract in humans.

Pandemic and infectious disease events can affect large populations. The transmission rates of pandemic illnesses are often higher in denser areas where there are large concentrations of people. Pandemic events can also occur after other natural disasters, particularly floods, when there is the potential for bacteria to grow and contaminate water.

Location of Potential Pandemic and Infectious Diseases

Pandemic and infectious disease risks are possible in all jurisdictions in Marshall County with the areas with the largest population having the greatest risk due to the potential for a contagion to easily spread from person to person.

Extent and Intensity of Pandemic and Infectious Diseases

The extent and intensity of a pandemic or infectious disease threat in Marshall County is dependent on the aggressiveness of the virus or bacteria in question, its ability to spread, mode of transmission and amount of contact between infected and uninfected people. Population density and the level of social interaction in any infected area can influence the overall impact of any communicable disease. Some pandemics occur after natural disasters, especially flood events, when bacteria has the opportunity to grow and contaminate water.

The extent of a pandemic may be worsened because outbreaks across the region lead to the inability to obtain assistance from surrounding areas since they are investing all their resources in fighting the disease in their own area. Also, different treatments and special supplies might be in high demand leading to a short supply or no availability in a time of need.

Previous Pandemic and Infectious Diseases Occurrences

Being a majority rural county lowers the risk of widespread casualty due to a pandemic or infectious diseases event but does not eliminate the risk. Many people who live in Marshall County work outside the area in such locations as Huntsville and Chattanooga where they can be exposed to the disease and bring it back to Marshall County.

Many episodes of influenza have impacted Marshall County through the years resulting in schools closing and impacting businesses. In 2016 there were 3 confirmed cases of Zika virus within the county and in 2017 a state of emergency was issued due to an avian flu outbreak. Schools were closed for a week due to the flu in February 2018. Prior to the school closings, Governor Kay Ivey had issued a declaration of a statewide public health emergency due to the flu in January.

Probability of Future Pandemic and Infectious Diseases Hazard Events

Infectious diseases will occur more frequently than pandemics with some strain of influenza impacting Marshall County every year. The magnitude of such an event will be dependent on the strain and the availability of a vaccine for that particular strain of flu. Pandemics will also occur but a much lower rate; however, when they do appear, the consequences can be far reaching and very impactful; harming people and the economy, and at times, animals. People must be well educated in how infectious diseases and pandemics are spread and how to prevent their transmission. The county should work with the health care industry and health departments to ensure educational materials are available and supplies that might be needed to address an outbreak are not expired and readily available. More information on mitigation measures to address pandemics and infectious diseases and pandemics can be found in Chapter Six – “Mitigation Strategy”.

5.4 Vulnerability of Structures within Each Jurisdiction

This section of Chapter Five includes an inventory of existing and future buildings, critical facilities, and infrastructure within Marshall County. An analysis of the vulnerability of this inventory to the hazards addressed in the risk assessment was conducted and its findings are presented. Vulnerability in this chapter refers to the exposure of buildings, critical facilities, and infrastructure to a particular hazard and their susceptibility to damage from the hazard. "Buildings" refer to all walled and roofed structures. Section 5.5, "Estimate of Dollar Losses to Vulnerable Structures," applies loss estimates to the inventory discussed in this section.

As demonstrated in the hazard profile section of this risk assessment, the jurisdictions located in Marshall County are equally at risk from most hazards. Riverine floods, sinkholes, landslides, and dam failures are location-specific hazards and the vulnerability of structures within the jurisdictions will vary. Pandemics and infectious diseases are not covered in this section because they do not impact structures.

5.4.1 Inventory Methodology

Structure inventories were assembled in three steps.

1) FEMA's Hazus-MH computer program was utilized to inventory the number and property values of structures within Marshall County. Hazus-MH is a risk assessment software used for projecting losses from floods, hurricane winds, and earthquakes. The latest edition of Hazus-MH software (version 4.2) was used. A Level 1 analysis was run which utilized data provided with the software to calculate damages at the county level. Because data accuracy tends to diminish when scenarios are run on smaller areas, calculations below the county level were not performed.

2) Population projections were applied to the Hazus-MH tables of existing building values to estimate future building values and exposure. The population projections and Hazus-generated structure counts and values are approximate but were helpful in determining areas of need when choosing and prioritizing mitigation measures.

3) Maps and tables of critical facilities were created using GIS data. The GIS data came from Marshall County, Geological Survey of Alabama, USGS, National Weather Service, NFIP, U.S. Census Bureau, Alabama State Data Center, and the Alabama Forestry Commission.

Hazus-MH includes critical facilities, infrastructure, and user-defined facilities in their analysis. The types of structures that fall under the classifications of critical facilities, infrastructure, and user-defined facilities are explained below.

Critical Facilities

- Essential Facilities. These critical facilities are essential to the health and welfare of the entire Marshall County population and are particularly critical following hazard events. Emergency response facilities (police, fire, and emergency management), medical care

facilities (hospitals and other care facilities), schools, and shelters for evacuation are all examples of essential facilities.

- High Potential Loss Facilities. These are facilities that will likely cause a large amount of loss if they are damaged. These critical facilities include military installations, nuclear power plants, hazardous materials sites, and dams.

Infrastructure

- Transportation Systems Lifeline. These facilities include highways, bridges, tunnels, heavy/light railways, airports, buses, ports, and waterways.
- Utility Systems Lifeline. These facilities are essential lifelines that include potable water, wastewater, natural gas, oil, electricity, and communications systems.

Other

- User-Defined Facilities. The user may include additional facilities or systems unique to their study region which are not included in the general Hazus-MH listing of critical facilities and infrastructure.

5.4.2 Hazus-MH Structure Inventory

General Description of the Planning Region

Hazus-MH refers to the geographic study area as the region, which is all of Marshall County, including all unincorporated areas and the seven municipalities. A more complete description of the planning region is presented in Chapter 3 "Community Profiles." The descriptions provided here were generated by the Hazus-MH Global Reports for county-wide assessments of flooding, earthquakes, and hurricanes. 2010 Census data was used for the region description in the Hazus-MH analysis. The Marshall County region is generally described by Hazus-MH, as follows:

- The geographical size of the region is approximately 623 square miles.
- The region contains 18 census tracts and 4,364 census blocks.
- There were over 35,000 households in the region, with a total population of 93,019 people.

Building Inventory

Hazus-MH estimates that there are approximately 40,870 buildings in the region, which have an estimated replacement value (excluding contents) of around 8.3 billion dollars. Of that value, 74.5%, or 6.2 billion dollars, is associated with residential housing, even though residential housing comprises 91.8% of the building inventory. Table 5-17 shows the building value of all structures within Marshall County per Hazus in terms of 2014 dollars. Table 5-18 breaks out the building inventory into percentages by the following occupancy types: agriculture, commercial, education, government,

industrial, religion, residential (single family) and residential (other) and Chart 5-3 shows the division of building by occupancy type and values. Existing and future dollar values of the structures within the region, divided by occupancy type, are presented in Table 5-19 and Chart 5-5.

Table 5-17. Hazus-MH Building Value Data

State	County Name	Building Value (millions of dollars) [2014 dollars]		
		Residential	Non-Residential	Total
Alabama	Marshall	$6,204	$2,135	$8,339

Table 5-18. Hazus-MH Building Inventory by Occupancy Type

Occupancy	Number of Buildings	Percent of Building Stock
Agriculture	170	0.4%
Commercial	2,250	5.5%
Education	50	0.1%
Government	69	0.2%
Industrial	603	1.5%
Religion	215	0.5%
Residential (Single Family)	29,613	72.5%
Residential (Other)	7900	19.3%
Total	40,870	100%

Chart 5-4. Hazus-MH Building Exposure by Occupancy Type

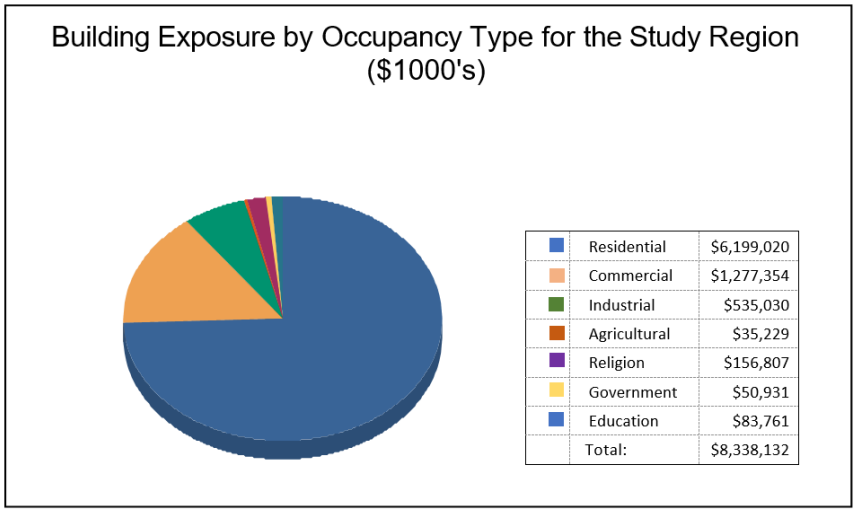


Table 5-19. Building Exposure by Occupancy Type

Occupancy	Existing Exposure ($1,000)	Future Exposure ($1,000)	% of Total (Future*)
Agriculture	$35,229	$35,370	0.4%
Education	$83,761	$84,599	1.0%
Government	$50,931	$51,237	0.6%
Religious	$156,807	$159,786	1.9%
Industrial	$535,030	$569,272	6.4%
Commercial	$1,277,354	$1,472,789	15.3%
Residential	$6,199,020	$10,804,892	74.3%
Total	$8,338,132	$13,177,944	100%

* Future = 2040.

Hazus also separates the structures by construction type. The types of material presented are wood, steel, concrete, precast, reinforced masonry, unreinforced masonry, and manufactured housing. This information is important because the materials used in construction determine how stable the structures will be during hazard events. In the Marshall County region, wood frame construction makes up 72% percent of the building inventory as shown in Table 5-20. This high percentage can be attributed to the number of residential buildings in the area. Manufactured housing accounts for approximately 17% of the structures, which is important to note due to their vulnerability to most hazards.

Table 5-20. Hazus-MH Building Inventory by Construction Type

Construction Type	Number of Buildings	Percent of Building Stock
Wood	29,427	72.0%
Steel	1,530	3.7%
Concrete	245	0.6%
Precast	99	0.2%
Reinforced Masonry	355	0.9%
Unreinforced Masonry	2,389	5.8%
Manufactured Housing	6,825	16.7%
Total	40,870	100.0%

Most hazards are county-wide and therefore the vulnerability to the structures within Marshall County are equal. While all structures have an equal probability of being impacted by region-wide hazards such as severe storms and tornadoes, residential structures will have a higher percentage of being impacted by a hazard over all other structures since they comprise 92% of the building stock in Marshall County. The two building occupancies that have the least percentage of structures are governmental and educational occupancies at 0.2% and 0.1% respectively. Although those buildings

make up a small percentage of the building inventory, depending on when a disaster hits, the consequences could be devastating due to the number of people in the structure at the time of the disaster.

Location-specific hazards, such as flooding, wildfires, dam or levee failures, sinkholes, and landslides can vary from minimal exposure to as much as 100% of a community's total geographic area. In cases where exposure is <1%, a 1% exposure rate has been applied. The percent exposure can be applied to the structure inventories to derive a general estimate of vulnerable structures by hazard. Although this does not yield a precise estimate, it provides a general indication of the number and types of structures exposed to each hazard within each jurisdiction. Table 5-21 shows the percentage of buildings exposed to a hazard by jurisdiction as determined by the risk assessment and other sources.

Table 5-21. Hazard Exposure Rates by Jurisdiction

Identified Hazard	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove	Unincorporated Marshall County
Tornadoes	100%	100%	100%	100%	100%	100%	100%	100%
Severe Storms	100%	100%	100%	100%	100%	100%	100%	100%
Flash Floods	1%	1%	1%	1%	1%	1%	1%	1%
Riverine Floods	1%	1%	1%	1%	1%	10%	2%	10%
Winter Storms & Extreme Cold	100%	100%	100%	100%	100%	100%	100%	100%
Hurricanes	100%	100%	100%	100%	100%	100%	100%	100%
Droughts	100%	100%	100%	100%	100%	100%	100%	100%
Extreme Heat	100%	100%	100%	100%	100%	100%	100%	100%
Wildfires	50%	50%	50%	100%	100%	75%	100%	100%
Dam or Levee Failures	1%	1%	1%	1%	1%	50%	50%	1%
Landslides	1%	1%	1%	1%	1%	1%	1%	1%
Earthquakes	100%	100%	100%	100%	100%	100%	100%	100%
Sinkholes	1%	1%	1%	1%	1%	1%	1%	1%
Human-Caused	100%	100%	100%	100%	100%	100%	100%	100%
Technological Hazards	100%	100%	100%	100%	100%	100%	100%	100%

To project the future number of buildings, critical facilities, and infrastructure to the year 2040, data provided by the Alabama State Data Center's projection of Marshall County population growth was used. Since no projections existed for individual jurisdictions, the method described here was

developed to provide a 2040 projected population for each jurisdiction. To project populations for each jurisdiction, the annual growth rate for each jurisdiction was calculated based upon population growth between 2000 and 2018. The unincorporated area projection is the countywide population less the total of all municipal populations.

Table 5-22. 2018 Population Distribution by Jurisdiction

Jurisdiction	2018 Population	% of Total
Marshall County	94,109	100.00%
Albertville	21,568	22.92%
Arab	8,321	8.84%
Boaz	9,656	10.26%
Douglas	772	0.82%
Grant	913	0.97%
Guntersville	8,482	9.01%
Union Grove	79	0.08%
Unincorporated Marshall County	44,318	47.09%

Source: U.S. Census, American Fact Finder

Table 5-23. Annual Growth Rates by Jurisdiction

Jurisdiction	2000	2010	2018	2000-2018 Growth	Percent Change 2000-2018	Annual Growth Rate
Marshall County	82,231	93,019	94,109	11,878	14.4%	0.8%
Albertville	17,247	21,160	21,568	4,321	25.1%	1.2%
Arab	7,174	8,050	8,321	1,147	16.0%	0.8%
Boaz	7,411	9,551	9,656	2,245	30.3%	1.5%
Douglas	530	744	772	242	45.7%	2.1%
Grant	665	896	913	248	37.3%	1.8%
Guntersville	7,395	8,197	8,482	1,087	14.7%	0.8%
Union Grove	94	77	79	-15	-16.0%	-1.0%

Most of Marshall County's jurisdictions are expecting to grow over the next 20 years. Marshall County's projected growth is 19.6% between 2018 and 2040. The largest growth is expected to be in Douglas with a growth of 57.97%. Union Grove is predicted to decline in population by 20.25%. Douglas and Union Grove are relatively small communities with populations of 772 and 72, respectively. In relation to the larger jurisdictions, Albertville is projected to grow by 32% from 21,568 people in 2018 to 28,4441 in 2040. Since 92% of the building inventory is residential, building inventory can be expected to change according to each jurisdiction's growth multiplier.

Table 5-24. 2040 Growth Projections and Multipliers

Jurisdiction	Estimated 2018	Annual Growth Rate	Projected 2040	Projected Change 2018-2040	Percent Increase 2018-2040	2040 Growth Multiplier
Marshall County	94,109	0.8%	112,141	18,032	19.16%	1.19
Albertville	21,568	1.2%	28,441	6,873	31.87%	1.32
Arab	8,321	0.8%	9,915	1,594	19.16%	1.19
Boaz	9,656	1.5%	11,586	1,930	19.99%	1.2
Douglas	772	2.1%	1,220	448	57.97%	1.58
Grant	913	1.8%	1,352	439	48.06%	1.48
Guntersville	8,482	0.8%	10,107	1,625	19.16%	1.19
Union Grove	79	-1.0%	63	-16	-20.25%	-1.2
Unincorporated*	44,318	0.3%	47,337	3,019	6.81%	1.07

Source: Derived from Alabama State Data Center and the U.S. Census

Using the numbers obtained from the growth projections and multipliers, the projected population distribution by jurisdiction for Marshall County in 2040 is presented in Table 5-25.

Table 5-25. 2040 Population Distribution by Jurisdiction

Jurisdiction	2040 Population	Percent of Total Population
Marshall County	112,141	100%
Albertville	28,441	25.4%
Arab	9,915	8.8%
Boaz	11,586	10.3%
Douglas	1,220	1.1%
Grant	1,352	1.2%
Guntersville	10,107	9.0%
Union Grove	63	0.1%
Unincorporated	47,337	42.2%

Source: Derived from Alabama State Data Center

Taking the growth projections and applying them to the existing values for buildings in Marshall County, future values can be estimated. Table 5-26 applies future values to the building values by jurisdiction by separating the building inventory into residential and non-residential and then multiplying by the growth multiplier for that jurisdiction. Albertville is the largest municipality, so it has the largest inventory of buildings for cities in Marshall County. The unincorporated areas of the county amount to twice that of the City of Albertville.

Table 5-26. Building Values by Jurisdiction

Jurisdiction	Building Value					
	Existing Residential	Future Residential	Existing Non-Residential	Future Non-Residential	Existing Total	Future Total
Marshall County	$3,701,748	$4,405,080	$1,561,769	$1,858,505	$5,263,517	$6,263,585
Albertville	$840,297	$1,109,192	$354,522	$467,969	$1,194,819	$1,577,161
Arab	$322,052	$383,242	$135,874	$161,690	$457,926	$544,932
Boaz	$377,578	$453,094	$159,300	$191,160	$536,878	$644,254
Douglas	$29,614	$46,790	$12,494	$19,741	$42,108	$66,531
Grant	$33,316	$49,308	$14,056	$20,803	$47,372	$70,111
Guntersville	$325,754	$387,647	$137,436	$163,549	$463,190	$551,196
Union Grove	$3,702	$2,962	$1,562	$1,250	$5,264	$4,211
Unincorporated	$1,769,436	$1,893,297	$746,526	$798,783	$2,515,962	$2,692,079

Note: Totals of all municipalities and unincorporated areas may not equal Marshall County totals due to rounding.
Future = 2040.

The same process was applied to the building count by occupancy and jurisdiction as shown in Table 5-27. Residential is projected to remain the largest occupancy of buildings in Marshall County followed by commercial and industry. Tables 5-28A and 5-28B apply the percent of exposure to the hazards from Table 5-19 and the growth multiplier to the existing building value per jurisdiction and provide an estimate of building exposure per hazard for each jurisdiction. All structures are equally susceptible to impacts from severe storms, tornadoes, winter storms, drought, extreme heat, earthquakes, hurricanes, human-caused, and technological hazards. Guntersville and unincorporated Marshall County are the jurisdictions with the most exposure to the location specific hazards.

Table 5-27. Building Count by Occupancy and Jurisdiction

Jurisdiction	Building Count by Occupancy															
	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future
	Agric.		Commercial		Education		Govt.		Industrial		Religion		Single Family		Other Res.	
Marshall County	175	208	2075	2469	43	51	60	71	599	713	193	230	26298	31295	11623	13831
Albertville	40	53	471	622	10	13	14	18	136	180	44	58	5970	7880	2638	3482
Arab	15	18	181	215	4	5	5	6	52	62	17	20	2288	2723	1011	1203
Boaz	18	22	212	254	4	5	6	7	61	73	20	24	2682	3218	1186	1423
Douglas	1	2	17	27	0	0	0	0	5	8	2	3	210	332	93	147
Grant	2	3	19	28	0	0	1	1	5	7	2	3	237	351	105	155
Guntersville	15	18	183	218	4	5	5	6	53	63	17	20	2314	2754	1023	1217
Union Grove	0	0	2	2	0	0	0	0	1	1	0	0	26	26	12	12
Unincorporated	84	90	992	1061	21	22	29	31	286	306	92	98	12570	13450	5556	5945

Note: Totals of all municipalities and unincorporated areas may not equal Marshall County totals due to rounding.
Future values are based on 2040 multipliers.

Table 5-28A. Building Exposure by Jurisdiction and Hazard ($1,000)

Jurisdiction		Severe Storms	Tornadoes	Flash Floods	Riverine Floods	Hurricanes	Winter Storms/ Extreme Cold	Droughts
Albertville	Existing	$1,194,819	$1,194,819	$11,948	$11,948	$1,194,819	$1,194,819	$1,194,819
	Future	$1,577,161	$1,577,161	$15,772	$15,772	$1,577,161	$1,577,161	$1,577,161
Arab	Existing	$457,926	$457,926	$4,579	$4,579	$457,926	$457,926	$457,926
	Future	$544,932	$544,932	$5,449	$5,449	$544,932	$544,932	$544,932
Boaz	Existing	$536,878	$536,878	$5,369	$5,369	$536,878	$536,878	$536,878
	Future	$644,254	$644,254	$6,443	$6,443	$644,254	$644,254	$644,254
Douglas	Existing	$42,108	$42,108	$421	$421	$42,108	$42,108	$42,108
	Future	$66,531	$66,531	$665	$665	$66,531	$66,531	$66,531
Grant	Existing	$47,372	$47,372	$474	$474	$47,372	$47,372	$47,372
	Future	$70,111	$70,111	$701	$701	$70,111	$70,111	$70,111
Guntersville	Existing	$463,190	$463,190	$4,632	$46,319	$463,190	$463,190	$463,190
	Future	$551,196	$551,196	$5,512	$55,120	$551,196	$551,196	$551,196
Union Grove	Existing	$5,264	$5,264	$53	$105	$5,264	$5,264	$5,264
	Future	$4,211	$4,211	$42	$84	$4,211	$4,211	$4,211
Unincorporated Marshall County	Existing	$2,515,962	$2,515,962	$25,160	$251,596	$2,515,962	$2,515,962	$2,515,962
	Future	$2,692,079	$2,692,079	$26,921	$269,208	$2,692,079	$2,692,079	$2,692,079

Future values are based on 2040 multipliers.

Table 5-28B. Building Exposure by Jurisdiction and Hazard ($1,000)

Jurisdiction		Extreme Heat	Wildfires	Dam or Levee Failures	Landslides	Earthquakes	Sinkholes	Human-Caused	Technological
Albertville	Existing	$1,194,819	$597,410	$11,948	$11,948	$1,194,819	$11,948	$1,194,819	$1,194,819
	Future	$1,577,161	$788,581	$15,772	$15,772	$1,577,161	$15,772	$1,577,161	$1,577,161
Arab	Existing	$457,926	$228,963	$4,579	$4,579	$457,926	$4,579	$457,926	$457,926
	Future	$544,932	$272,466	$5,449	$5,449	$544,932	$5,449	$544,932	$544,932
Boaz	Existing	$536,878	$268,439	$5,369	$5,369	$536,878	$5,369	$536,878	$536,878
	Future	$644,254	$322,127	$6,443	$6,443	$644,254	$6,443	$644,254	$644,254
Douglas	Existing	$42,108	$42,108	$421	$421	$42,108	$421	$42,108	$42,108
	Future	$66,531	$66,531	$665	$665	$66,531	$665	$66,531	$66,531
Grant	Existing	$47,372	$47,372	$474	$474	$47,372	$474	$47,372	$47,372
	Future	$70,111	$70,111	$701	$701	$70,111	$701	$70,111	$70,111
Guntersville	Existing	$463,190	$347,393	$231,595	$4,632	$463,190	$4,632	$463,190	$463,190
	Future	$551,196	$413,397	$275,598	$5,512	$551,196	$5,512	$551,196	$551,196
Union Grove	Existing	$5,264	$5,264	$2,632	$53	$5,264	$53	$5,264	$5,264
	Future	$4,211	$4,211	$2,106	$42	$4,211	$42	$4,211	$4,211
Unincorporated Marshall County	Existing	$2,515,962	$2,515,962	$25,160	$25,160	$2,515,962	$25,160	$2,515,962	$2,515,962
	Future	$2,692,079	$2,692,079	$26,921	$26,921	$2,692,079	$26,921	$2,692,079	$2,692,079

Future values are based on 2040 multipliers

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Critical Facilities Inventory

Included among the building inventory is the critical facilities category which is divided into the two groups: essential facilities and high potential loss facilities. Each group is described below and the estimated number of each type of facility in Marshall County, as provided by Hazus, are noted.

Essential facilities - Hazus-MH includes: hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities which are shown on Table 5-29.

High potential loss facilities – Hazus-MH includes dams, levees, hazardous materials sites, military installations, and nuclear power plants. There are no military installation or nuclear power plants located in Marshall County so they are not included in the list of high potential loss facilities or the analysis. These facilities are shown on Table 5-30.

According to Hazus-MH, Marshall County has 66 essential facilities. There are 42 high potential loss facilities, including 5 dams and 37 hazardous materials sites. As population increases, additional essential facilities should be added. Future estimates for the facilities are provided in the following tables.

Table 5-29. Hazus-MH Essential Facilities Data

Classification	Existing Estimate	Future Estimate (2040)
Hospitals	2 (192 total bed capacity)	3 (228 total bed capacity)
Fire Stations	18	21
Police Stations	10	12
Schools	34	41
EOCs	2	2

Table 5-30. Hazus-MH High Potential Loss Facilities Data

Classification	Existing Estimate	Future Estimate (2040)
Dams	5	6
Hazard Materials Sites	37	44

Transportation and Utility Lifeline Inventories

Lifeline inventories are divided into two groups, transportation systems and utility systems. Hazus-MH estimates the total value of the lifeline inventory at approximately $2.2 billion, with estimated replacement costs of around $1.4 billion for transportation and $0.8 billion for utility infrastructure.

Transportation systems – Hazus-MH classifies highways, railways, light rail, bus, ports, ferry, and airports under the transportation system lifeline inventory list. Marshall County does not have light rail, bus, or ferry services so they are not included in the analysis. Most of the at-risk transportation system components are highway road segments and bridges, which are most vulnerable to flooding. Transportation infrastructure inventories appear below.

Table 5-31. Transportation System Lifeline Inventory

System	Component	No. of Locations or No. of Segments	Replacement value (Millions of Dollars)
Highway	Bridges	116	$87.54
(132 miles)	Segments	36	$1120.40
		Subtotal	$1207.96
Railways	Bridges	0	0
	Facilities	1	$2.66
	Segments	13	$27.20
		Subtotal	$29.86
Port	Facilities	17	$33.95
		Subtotal	$33.95
Airport	Facilities	2	$21.30
	Runways	2	$75.93
		Subtotal	$97.23
Total			$1,369.00

Utility systems - Hazus-MH classifies potable water, wastewater, natural gas, crude and refined oil, electric power, and communications under utility system lifeline. Marshall County does not have any crude or refined oil systems, so they are not included in the analysis. The types of utilities most vulnerable to hazards are electric power lines and substations, water treatment and distribution facilities and wastewater treatment plants. A thorough review of the hazard profiles (found in Section 5.3) reveals that the most common disruption to utility services is from powerlines being damaged during hazard events followed by issues with waterlines. Overall, severe storms, tornadoes, and flooding pose the greatest threat to these facilities.

Table 5-32. Utility System Lifeline Inventory

System	Component	No. of Locations or No. of Segments	Replacement value (Millions of Dollars)
Potable Water	Distribution Lines	3,141 miles	$101.09
	Facilities	2	$59.94
		Subtotal	$161.03
Wastewater	Distribution Lines	1,884 miles	$60.65
	Facilities	7	$419.58
		Subtotal	$480.23
Natural Gas	Distribution Lines	1,256 miles	$40.43
	Facilities	0	0
		Subtotal	$40.43
Electrical Power	Facilities	1	$99

System	Component	No. of Locations or No. of Segments	Replacement value (Millions of Dollars)
(Hydro Dam)		Subtotal	$99
Communication (Broadcasting)	Facilities	8	$0.72
		Subtotal	$0.72
Total			$781.41

Local Inventories of Critical Facilities and Infrastructure

Data from the US Company Database (2020), the participating jurisdictions, the Army Corps of Engineers, and the Marshall County EMA was compiled to create a local inventory of critical facilities as well as transportation and utility lifelines. The following pages contain maps and tables showing the locations of major critical facilities and utility lifelines.

There are 89 government facilities throughout Marshall County. Nineteen of the government buildings are federally owned buildings such as Post Offices and military offices. Nine government buildings are State buildings and nineteen are related to County government business. The majority of these buildings can be found within the municipalities, but some are located in unincorporated areas.

Map 5-49. Marshall County Government Facilities

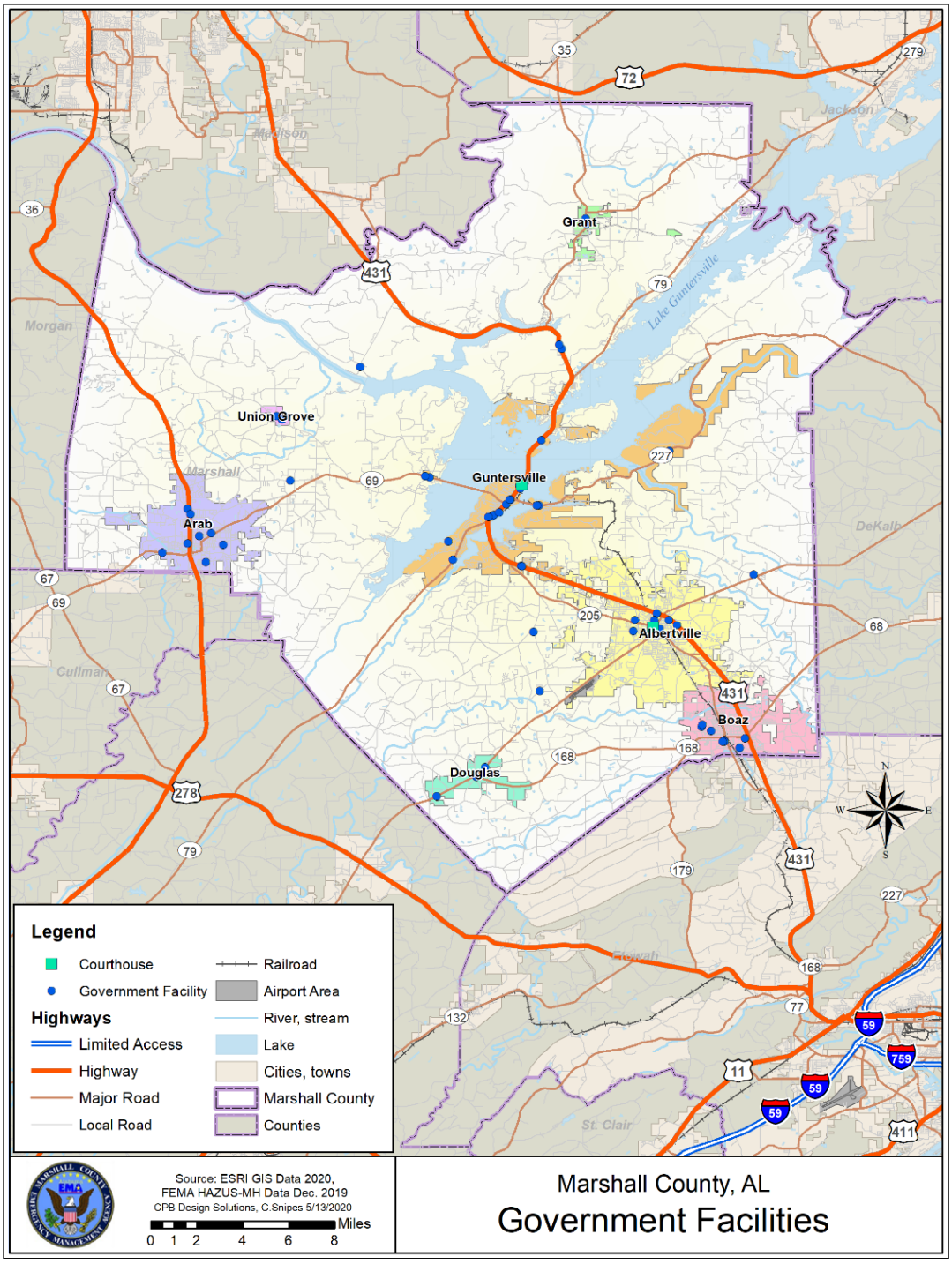


Table 5-33. Government Facilities

Agency	Type	Address	City
Alabama Alcoholic Beverage Control Bd.	Regulation, Miscellaneous Commercial Sectors	511 Gunter Ave	Guntersville
Alabama Cooperative Extension	Legislative Bodies	424 Blount Ave # G21	Guntersville
Alabama Department Human Res Food Stamps	Administration of Social and Manpower Programs	180 Bluff Road	Guntersville
Alabama Department Transportation	Regulation, Administration of Transportation	15 Dunn Dr.	Albertville
Alabama Department Transportation Main	Regulation, Administration of Transportation	23445 Us Highway 431	Guntersville
Alabama Forestry Commission	Forestry Services	336 Yacht Club Rd	Guntersville
Alabama Health Department Public	Administration of Public Health Programs	88 Henryville Cir	Guntersville
Alabama Human Resources-Family Options	Legislative Bodies	180 Bluff Road	Guntersville
Alabama State Judicial System	Courts	133 S Emmett St	Albertville
Albertville City Hall	Executive Offices	116 W Main St	Albertville
Albertville Magistrate Office	Courts	200 Sand Mountain Dr. # A	Albertville
Albertville Maintenance Shop	Legislative Bodies	404 Highland Ave	Albertville
Albertville Maintenance Shop	Legislative Bodies	700 Half Section Line Rd	Albertville
Albertville Neighborhood Center	Legislative Bodies	915 W McKinney Ave	Albertville
Albertville Senior Citizen Center	Legislative Bodies	221 E Main St	Albertville
Arab City Hall	Executive Offices	740 N Main St	Arab
Arab City School District	Administration of Educational Programs	750 Arabian Dr NE	Arab
Arab Community Center	Legislative Bodies	232 City Park Dr NE	Arab
Arab Community Center	Legislative Bodies	772 Shoal Creek Trail NE	Arab
Boaz City Hall	Executive Offices	112 N Broad St	Boaz
Boaz City Municipal Court	Courts	101 Line Ave	Boaz
Boaz Complex Maintenance Shop	Legislative Bodies	280 Collier St	Boaz

Agency	Type	Address	City
Boaz Housing Authority	Housing Programs	199 S Broad St	Boaz
Boaz Neighborhood Center	Legislative Bodies	314 N King St	Boaz
Boaz Softball Complex	Legislative Bodies	204 Collier St	Boaz
Douglas Town Hall	Executive Offices	55 Highway 168	Douglas
Farm Service Agency	Regulation of Agricultural Marketing	1206 Gunter Ave	Guntersville
Grant Clerk's Office	Legislative Bodies	5379 Main St	Grant
Grant Town Hall	Executive Offices	4766 Main St	Grant
Guntersville City Garage	Legislative Bodies	325 Gunter Ave	Guntersville
Guntersville City Hall	Executive Offices	341 Gunter Ave	Guntersville
Guntersville City School District	Administration of Educational Programs	4200 AL Hwy 79 S	Guntersville
Guntersville Housing Authority	Housing Programs	1205 Wyeth Dr.	Guntersville
Guntersville Municipal Court	Courts	325 Gunter Ave	Guntersville
Guntersville Public Transportation	Legislative Bodies	1741 Blount Ave	Guntersville
Guntersville Traffic Court	Courts	425 Gunter Ave	Guntersville
Lake Guntersville State Park	Land, Mineral, And Wildlife Conservation	7966 Highway 227	Guntersville
Marshall County Council on Aging	Administration of Social and Manpower Programs	436 Blount Ave	Guntersville
Marshall County Child Support Svc	Administration of Social and Manpower Programs	180 Bluff Road	Guntersville
Marshall County Commission Dist. #2	Legislative Bodies	21 1st Ave W #B	Grant
Marshall County Commission	Legislative Bodies	3850 Eddy Scant City Rd	Arab
Marshall County Courthouse	Legislative Bodies	425 Gunter Ave	Guntersville
Marshall County Courts	Courts	200 W Main St	Albertville
Marshall County Emergency Tele. Serv.	Public Order and Safety	655 4th Ave NW	Arab
Marshall County Even Start	Administration of Educational Programs	12316 US Highway 431	Guntersville
Marshall County Food Stamps	Administration of Social and Manpower Programs	180 Bluff Road	Guntersville

Agency	Type	Address	City
Marshall County Garage	Regulation, Administration of Transportation	2251 Oneonta Cut Off Rd	Albertville
Marshall County Health Department	Administration of Public Health Programs	4200 Highway 79 S #B	Guntersville
Marshall County Legislative	Legislative Bodies	412 Gunter Ave #A	Guntersville
Marshall County Maintenance Department	Legislative Bodies	12380 US Highway 431	Guntersville
Marshall County Offices	Courts	424 Blount Ave	Guntersville
Marshall County Probate Office	Legislative Bodies	301 N Main St	Arab
Marshall County Senior Program	Legislative Bodies	1805 Gunter Ave # A1	Guntersville
Marshall County Sign Shop	Legislative Bodies	123 Hustleville Rd	Albertville
Marshall Mobile Home Division	Legislative Bodies	424 Blount Ave #124	Guntersville
Marshall Public Safety-Drivers' License	Regulation, Administration of Transportation	357 Blount Ave	Guntersville
Tennessee Valley Authority	Land, Mineral, And Wildlife Conservation	2325 Henry St	Guntersville
Tennessee Valley Authority	Land, Mineral, And Wildlife Conservation	3969 Highway 69	Guntersville
Top of Alabama Reg. Housing Authority	Housing Programs	923 Denson Ave	Boaz
Union Grove Town Hall	Executive Offices	3680 Union Grove Rd	Union Grove
US Army Corps of Eng. Reservoir Maintenance	Legislative Bodies	3780 Guntersville Dam Rd	Guntersville
US Army Corps of Engineers	National Security	3780 Guntersville Dam Rd	Grant
US Army National Guard	National Security	3550 Creek Path Rd	Guntersville
US Army National Guard Recruiter	National Security	505 E McKinney Ave	Albertville
US Army National Guard Recruiter	National Security	1644 Cullman Rd	Arab
US Army Recruiting	National Security	7419 Us Highway 431 #E	Albertville
US Department of Agriculture	Land, Mineral, And Wildlife Conservation	6232 US Highway 431	Albertville
US Navy Recruiting	National Security	1208 Gunter Ave #A	Guntersville
US Post Office	U.S. Postal Service	819 N Main St	Arab
US Post Office	U.S. Postal Service	3935 Union Grove Rd	Union Grove

Agency	Type	Address	City
US Post Office	U.S. Postal Service	5319 Main St	Grant
US Post Office	U.S. Postal Service	210 S Hambrick St	Albertville
US Post Office	U.S. Postal Service	109 S Snead St	Boaz
US Post Office	U.S. Postal Service	9365 AL Highway 75	Horton
US Post Office	U.S. Postal Service	520 Gunter Ave	Guntersville
US Post Office	U.S. Postal Service	6396 Highway 75	Horton
US Social Security Administration	Administration of Social and Manpower Programs	301 W Main St	Albertville
US Veterans Affairs Department	Administration of Veterans' Affairs	424 Blount Ave	Guntersville
USDA Federal-State Grain Inspection	Regulation of Agricultural Marketing	3209 Lake Guntersville Park	Guntersville

Public safety facilities in Marshall County are well distributed throughout the county and most are located on or near major roadways for ease of access. The majority of these facilities are for fire and/or rescue, with 21 of the facilities existing for volunteer fire departments. Each of the jurisdictions has a police department and the Marshall County Sheriff's Department serves the unincorporated areas of the County.

Map 5-50. Marshall County Public Safety Facilities

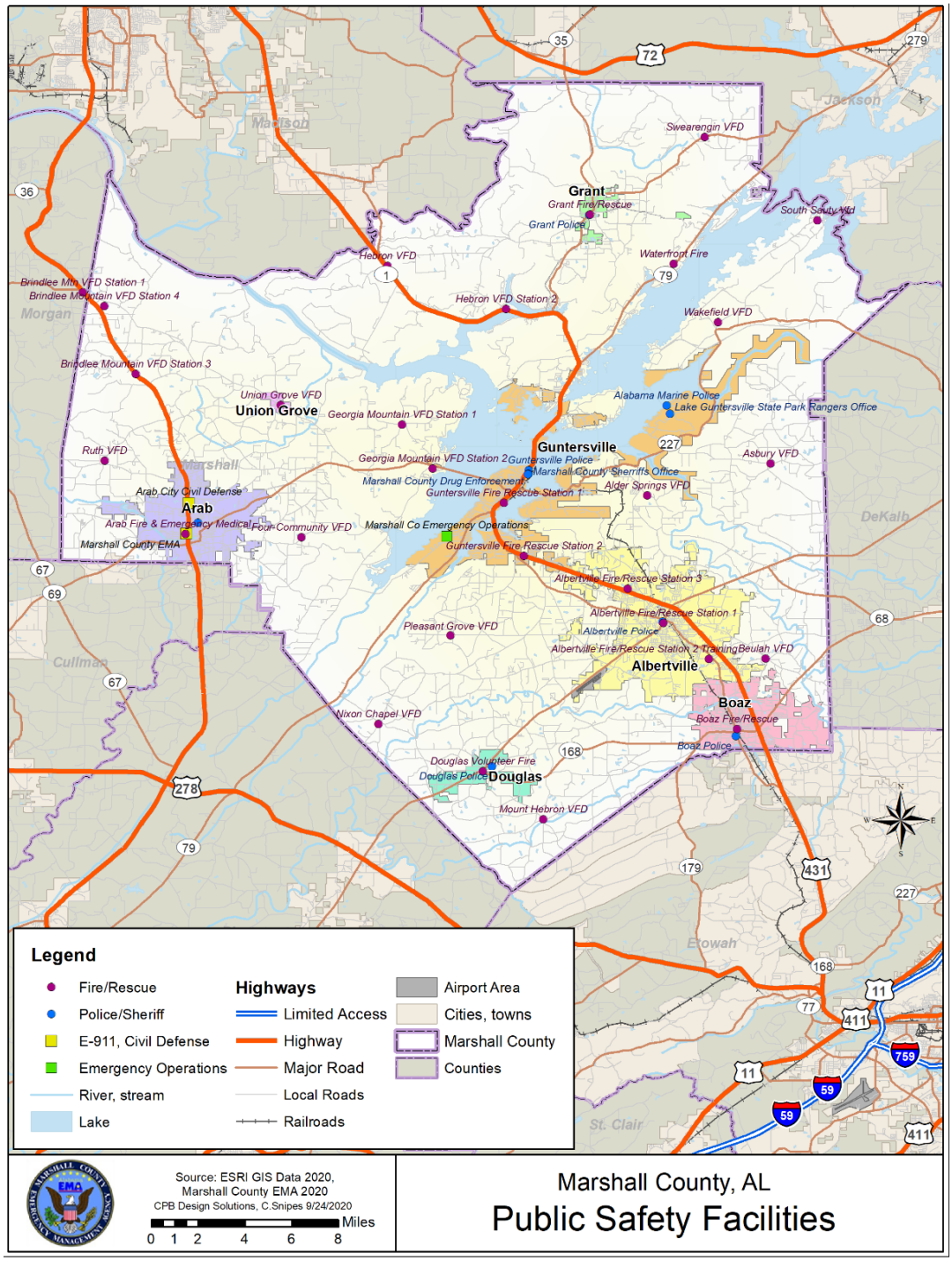


Table 5-34. Marshall County Public Safety Facilities

Agency	Type	Address	City
Alabama Marine Police District One	Police	1155 Lodge Dr	Guntersville
Albertville City Police Dept.	Police	201 S Broad St	Albertville
Albertville Fire Rescue Station 1	Fire / Rescue	212 S Broad St	Albertville
Albertville Fire Rescue Station 2	Fire / Rescue	590 Medlock Rd	Albertville
Albertville Fire Rescue Station 3	Fire / Rescue	402 Mitchell Ave	Albertville
Alder Springs Volunteer Fire Dept.	Fire	5915 Hustleville Rd	Albertville
Arab Fire Rescue Station 1	Fire / Rescue	653 4th Ave NW	Arab
Arab City Civil Defense	Emergency Op	740 N. Main St	Arab
Arab City Police Dept.	Police	740 N Main St	Arab
Asbury Volunteer Fire Dept.	Fire	4104 Martling Gap Rd	Albertville
Beulah Mountain Volunteer Fire Dept.	Fire	2686 Beulah Rd	Boaz
Boaz City Police Dept.	Police	101 Line Ave	Boaz
Boaz Fire Rescue	Fire / Rescue	201 Brown St	Boaz
Brindlee Mountain Volunteer Fire Dept. Station 1	Fire	4434 US Hwy 231	Union Grove
Brindlee Mountain Volunteer Fire Dept. Station 3	Fire	12302 US Hwy 231	Union Grove
Douglas Police Dept.	Police	55 AL Hwy 168	Douglas
Douglas Volunteer Fire Dept.	Fire	165 Al Hwy 165	Douglas
Four Community Volunteer Fire Dept.	Fire	3921 Brashiers Chapel Rd	Arab
Georgia Mountain Volunteer Fire Dept. Station 1	Fire	2485 Georgia Mountain Rd	Guntersville
Georgia Mountain Volunteer Fire Dept. Station 2	Fire	115 Water Works Rd	Guntersville
Grant Police Dept.	Police	4766 Main St	Grant
Grant Volunteer Fire Dept.	Fire	4077 Main St	Grant
Guntersville City Police Dept.	Police	340 Blount Ave	Guntersville
Guntersville Fire Rescue Station 1	Fire / Rescue	1745 Blount Ave	Guntersville
Guntersville Fire Rescue Station 2	Fire / Rescue	12901 US Highway 431	Guntersville
Guntersville Fire Rescue Station 3	Fire / Rescue	311 Buck Island Dr.	Guntersville
Guntersville Rescue Squad	Rescue	2350 Miller St	Guntersville
Hebron Volunteer Fire Dept. Station 1	Fire	90 Hebron School Rd	Grant
Hebron Volunteer Fire Dept. Station 2	Fire	1755 Merrille Mt Rd	Grant
Lake Guntersville State Park Rangers	Police/Sherriff	1157 Lodge Drive	Guntersville
Marshall County 911 Center	Emergency	655 4th Ave NW	Arab
Marshall County Community Corrections	Corrections	119 Sand Mountain Dr	Albertville

Agency	Type	Address	City
Marshall County District Attorney	Investigation	425 Blount Ave	Guntersville
Marshall County Drug Enforcement	Law Enforcement	435 Blount Ave	Guntersville
Marshall County Emergency Management	Emergency Management	3550 Creek Path Rd	Guntersville
Marshall County Sheriff's Office	Law Enforcement	423 Blount Ave	Guntersville
Mt Hebron Volunteer Fire Dept.	Fire	3038 Mount Hebron Rd	Boaz
Nixon Chapel Volunteer Fire Dept.	Fire	7925 Nixon Chapel Rd	Horton
Pleasant Grove Volunteer Fire	Fire	7275 Section Line Rd	Albertville
Ruth Volunteer Fire Dept.	Fire	3075 Matt Morrow Rd	Arab
South Sauty Volunteer Fire Dept.	Fire	122 Murphy Hill Dr	Langston
Swearengin Volunteer Fire Dept.	Fire	5120 Swearengin Rd	Scottsboro
TVA Police	Police	3464 Snow Point Rd	Guntersville
Union Grove Volunteer Fire Dept.	Fire	3680 Union Grove Rd	Union Grove
Union Rescue Squad	Rescue	500 Double Bridges Rd	Boaz
Wakefield Volunteer Fire Dept.	Fire	777 S Sauty Rd	Langston
Waterfront Volunteer Fire Dept.	Fire	5515 Scottsboro Highway	Scottsboro

The twenty-five childcare centers in Marshall County are almost exclusively found in the larger municipalities of Albertville, Arab, Boaz, and Guntersville. The only exception is Bethany Baptist Church in Horton which is located approximately halfway between Albertville and Douglas.

Map 5-51. Marshall County Childcare Centers

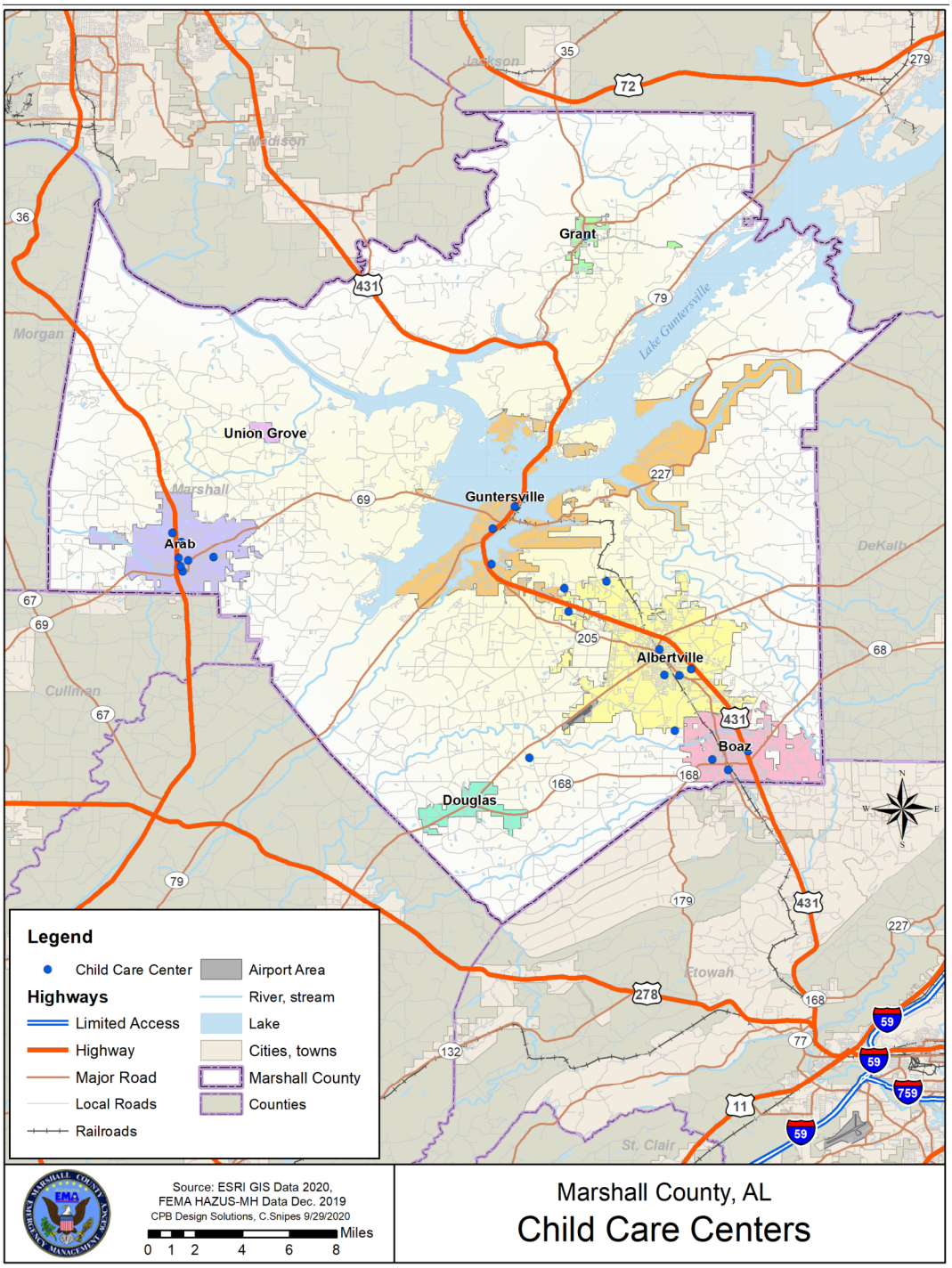


Table 5-35. Marshall County Childcare Centers

Name	Address	City
Albertville Early Learning	4465 US Highway 431	Albertville
Arab City Head Start	324 Cullman Rd	Arab
Arab Kids Kollege	414 2nd Ave NW	Arab
Arab Kids Kollege, LLC	521 6th Ave NW	Arab
Bethany Baptist Church	344 Bethany Road	Horton
Boaz Child Dev Center	314 North King Street	Boaz
Brashers Chapel Church	1631 Brashers Chapel Rd	Albertville
Central Primary School	906 Cooley Street	Albertville
Connect Church	4525 Wyeth Drive	Guntersville
First Baptist Church of Boaz	225 South Main Street	Boaz
Grace Place	1058 North Main Street	Arab
Gilliam Springs Child Development Center	1351 N. Brindlee Mt. Pkwy	Arab
Great Day Kindergarten	552 9th Street NE	Arab
Guntersville Child Development Center	1648 Obrig Avenue	Guntersville
Hope Kids' Club	1110 Walnut Street	Albertville
Kids First	502 N Main St	Arab
Kid's Junction Guntersville, LLC	3385 Brashers Chapel Road	Guntersville
Kids Korner	539 Gunter Avenue	Guntersville
Kingdom Kids	4525 Wythe Drive	Guntersville
Mount Vernon Baptist Church	2650 Pine Street	Albertville
New Life United Methodist Church	5256 Main Street	Grant
Solitude Baptist Church	2935 Solitude Road	Albertville
The Academy of Early Learning, LLC	1003 Bruce Road	Boaz
The Children's Place	204 Madison Avenue	Albertville
Village School	904 Baltimore Avenue	Albertville

Of the thirty-nine school buildings in Marshall County, thirty-five of them are public school buildings serving K-12 students, one is a private school for Pre-K to 12th grade, one is a private school for Pre-K to 5th grade, and two buildings belong to Snead State Community College. Most of the school buildings are located in or very near to the incorporated jurisdictions.

Map 5-52. Marshall County Schools

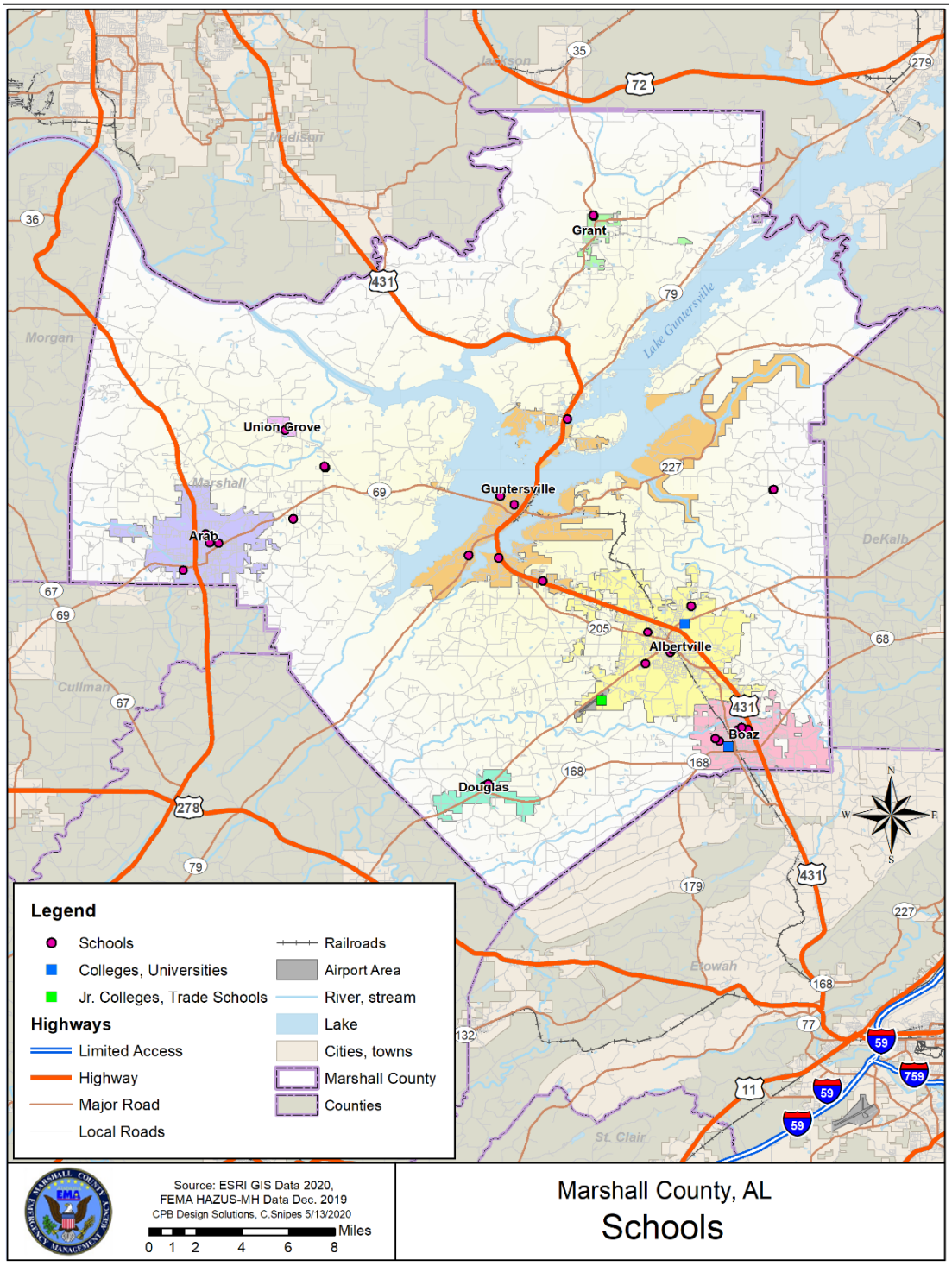


Table 5-36. Marshall County Schools

Name	Type	Address	Community
Albertville Elementary School	Elementary/Secondary	1100 Horton Rd	Albertville
Albertville High School	Elementary/Secondary	402 E McCord Ave	Albertville
Albertville Middle School	Elementary/Secondary	600 E Alabama Ave	Albertville
Albertville Primary School	Elementary/Secondary	1100 Horton Rd	Albertville
Asbury Elementary School	Elementary/Secondary	1966 Asbury Rd	Albertville
Asbury High School	Elementary/Secondary	1990 Asbury Rd	Albertville
Big Spring Lake Elementary School	Elementary/Secondary	257 Country Club Rd	Albertville
Evans Elementary School	Elementary/Secondary	901 W McKinney Ave	Albertville
Marshall Christian Academy	Elementary/Secondary	1631 Brashers Chapel Rd	Albertville
Arab Elementary School	Elementary/Secondary	241 8th Ave NE	Arab
Arab High School	Elementary/Secondary	511 Arabian Dr NE	Arab
Arab Junior High School	Elementary/Secondary	911 Old Cullman Rd SW	Arab
Arab Primary School	Elementary/Secondary	121 Mimosa St NE	Arab
Brindlee Mountain Elementary School	Elementary/Secondary	2233 Shoal Creek Rd	Arab
Snead State Junior College	College	261 South Main St	Arab
Boaz Elementary School	Elementary/Secondary	362 Collier St	Boaz
Boaz High School	Elementary/Secondary	907 Brown St	Boaz
Boaz Intermediate School	Elementary/Secondary	11 Newt Parker Dr.	Boaz
Boaz Middle School	Elementary/Secondary	140 Newt Parker Dr	Boaz
Corley Elementary School	Elementary/Secondary	505 Mount Vernon Rd	Boaz
Snead State Junior College	College	220 N Walnut St	Boaz
Douglas Elementary School	Elementary/Secondary	151 Eagle Dr	Douglas
Douglas Middle School	Elementary/Secondary	205 Eagle Dr	Douglas
Douglas High School	Elementary/Secondary	225 Eagle Dr	Douglas
DAR High School	Elementary/Secondary	6077 Main St	Grant
DAR Elementary School	Elementary/Secondary	6077 Main St	Grant
DAR Middle School	Elementary/Secondary	6077 Main St	Grant
Lake City Christian Academy	Elementary/Secondary	5025 Spring Creek Dr	Guntersville
Brindlee Mountain High School	Elementary/Secondary	994 Scant City Rd	Guntersville
Brindlee Mountain Middle School	Elementary/Secondary	994 Scant City Rd	Guntersville
Cherokee Elementary School	Elementary/Secondary	3300 Highway 79 S	Guntersville
Claysville Junior High School	Elementary/Secondary	140 Claysville School Rd	Guntersville
Guntersville Elementary School	Elementary/Secondary	1800 Lusk St	Guntersville
Guntersville High School	Elementary/Secondary	14227 US Highway 431	Guntersville
Guntersville Middle School	Elementary/Secondary	901 Sunset Dr	Guntersville
Marshall Technical School	Technical	12312 Us Highway 431	Guntersville

Name	Type	Address	Community
Robert D. Sloman Primary School	Elementary/Secondary	200 Bethlehem Rd	Horton
Brindlee Mountain Primary School	Elementary/Secondary	3685 Union Grove Rd	Union Grove

Marshall County has two hospitals, four urgent care facilities and twelve facilities classified as either assisted living or nursing homes. Each of these, as well as the other types of healthcare facilities, are exclusively located in the cities of Albertville, Arab, Boaz, and Guntersville.

Map 5-53. Marshall County Hospitals and Elderly Care Facilities

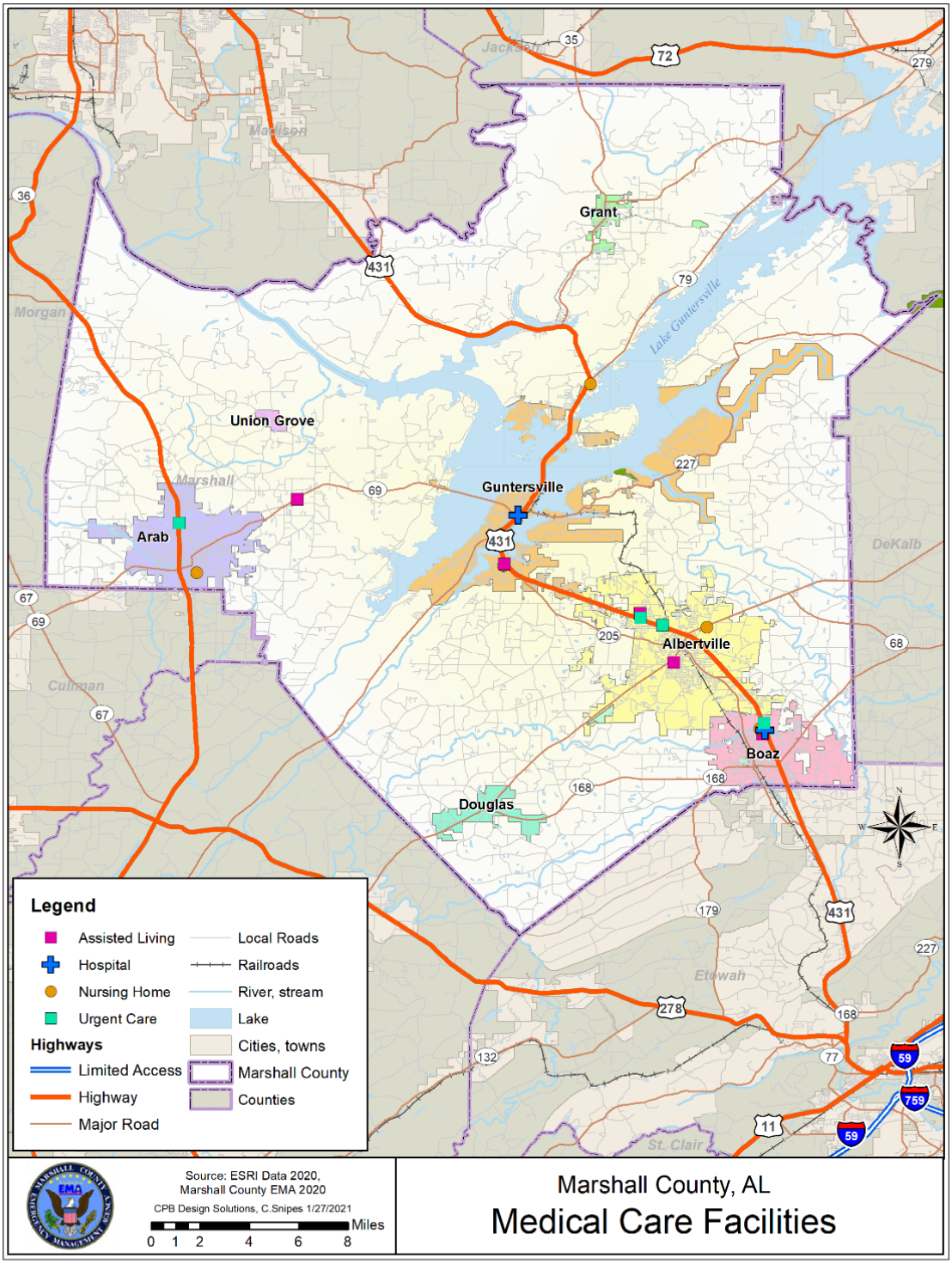


Table 5-37. Marshall County Hospital and Elderly Care Facilities

Name	Type	Address	City
Albertville Nursing Home	Nursing Home	750 AL Highway 75 N	Albertville
Assisted Living of Arab	Assisted Living	8895 AL Highway 69	Arab
Barfield Health Care Inc.	Nursing Home	22444 US Highway 431	Guntersville
Branchwater Village, LLC	Nursing Home	763 Medical Center Pkwy	Boaz
Davita Boaz	Dialysis	16 Central Henderson Rd	Boaz
Diversicare Of Arab	Nursing Home	235 3rd St	Arab
Diversicare Of Boaz	Nursing Home	600 Corley Ave	Boaz
Lakeview Dialysis	Dialysis	45 Medical Park Dr	Guntersville
Marshall Cancer Care Center	Cancer Care	11491 US Hwy 431	Albertville
Marshall Manor Nursing Home	Nursing Home	3120 North St	Guntersville
Marshall Medical Center North	Hospital	8000 AL Highway 69	Guntersville
Marshall Medical Center South	Hospital	2505 Highway 431	Boaz
Merrill Gardens at Albertville	Assisted Living	151 Woodham Dr	Albertville
Terrace Lake Village	Assisted Living	100 Terrace Lake Dr	Guntersville
Brookdale Albertville Alf	Assisted Living	151 Woodham Dr	Albertville
Bridgewood Gardens	Assisted Living	151 Woodham Dr	Albertville
Assisted Living of Albertville	Assisted Living	709 S Broad St	Albertville
Doctors Medcare of Albertville	Urgent Care	604 Smith Rd	Albertville
Care Plus Family Medical	Urgent Care	8914 US 431	Albertville
Go Medical Group	Urgent Care	2692 US 431	Boaz
Mainstreet Family Care	Urgent Care	1420 N Brindlee Mountain Pkwy Suite A-1	Arab

There are a total of 41 community shelters established throughout Marshall County. They are spread throughout the county for ease of access for all citizens of the county during weather events. There are more shelters within the municipalities to account for and accommodate larger populations who may need shelter.

Map 3-54. Marshall County Community Shelters

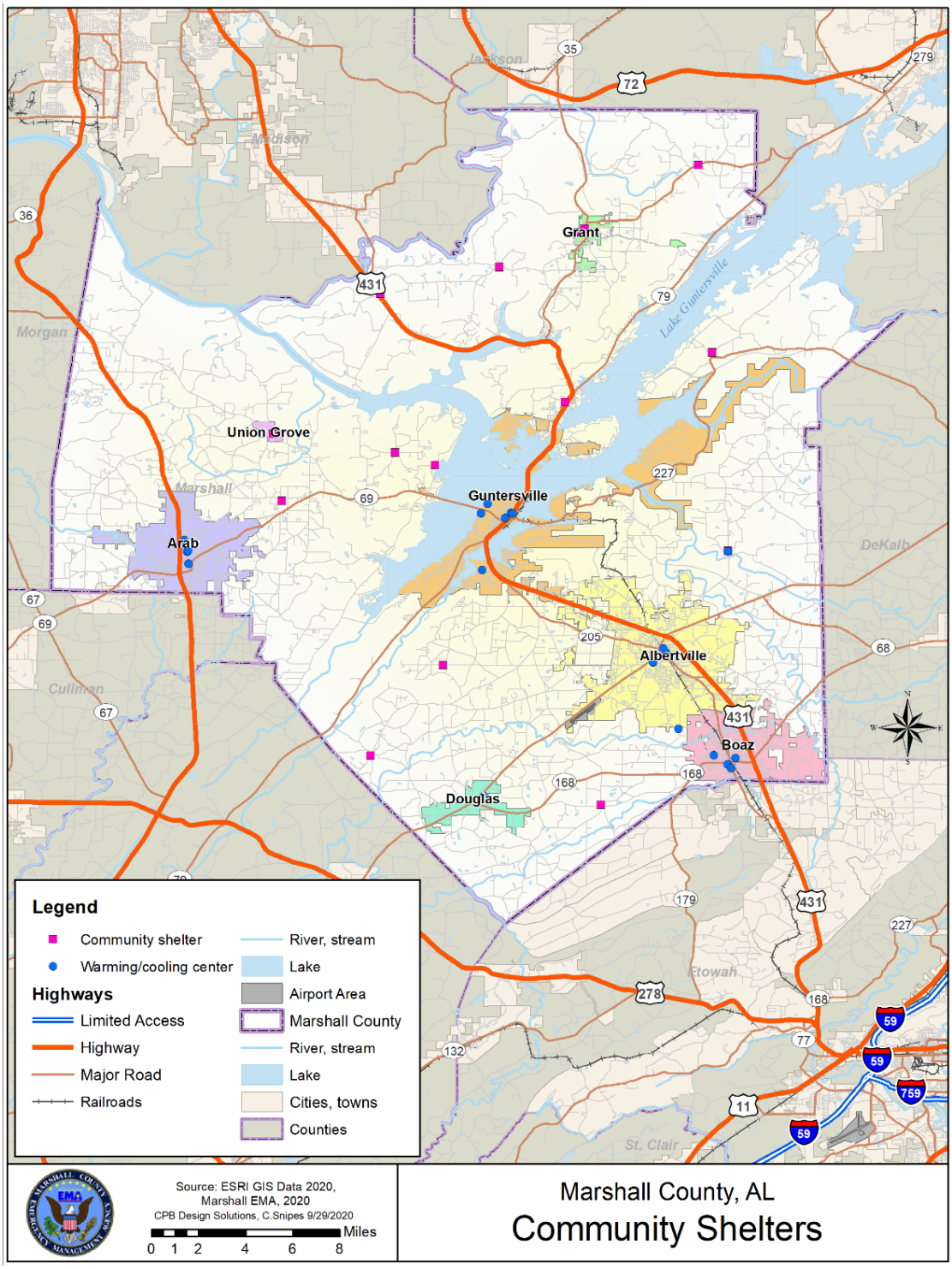


Table 5-38. Marshall County Community Shelters

Name / Location	Type	Address	City / Town
Asbury Martling / Community Center	Tornado Shelter	4059 Martling Rd	Albertville
Brindlee Mountain VFD	Tornado Shelter	4373 US Hwy 231 N	Guntersville
Claysville / Cedar Lodge Center	Tornado Shelter	22165 US Hwy 431	Guntersville
Douglas / Douglas Town Hall	Tornado Shelter	165 AL Hwy 168	Douglas
Georgia Mountain / Georgia Mtn. VFD	Tornado Shelter	2485 Georgia Mtn. Rd	Guntersville
Grant / District 2 Shop	Tornado Shelter	21 1st Avenue West	Grant
Grant / Grant Senior Center	Tornado Shelter & WC	307 2nd Ave West	Grant
Hebron / Hebron VFD	Tornado Shelter	90 Hebron School Road	Grant
Mt. Pleasant / Community Center	Tornado Shelter	5743 Simpson Point Rd	Grant
Nixon Chapel / Nixon Chapel VFD	Tornado Shelter	7925 Nixon Chapel Rd	Horton
Pleasant Grove / Pleasant Grove VFD	Tornado Shelter	7275 Section Line Rd	Albertville
Riverview / Riverview Campground	Tornado Shelter	1345 Cha-La-Kee Rd	Guntersville
Scant City / District 1 Shop	Tornado Shelter	3850 Eddy Scant Rd	Arab
Swearengin / Swearengin VFD	Tornado Shelter	5120 Swearengin Rd	Swearengin
Union Grove / Union Grove Town Hall	Tornado Shelter	3680 Union Grove Rd	Union Grove
Wakefield / Wakefield VFD	Tornado Shelter	777 South Sauty Rd	Langston
Whitesville / Whitesville Church	Tornado Shelter	118 Whitesville Church Rd	Boaz
Albertville Senior Center	Place of Refuge & WC	709 S Broad St	Albertville
Albertville Board of Education	Place of Refuge	107 West Main Street	Albertville
Arab Senior Center	Place of Refuge & WC	800 North Main Street	Arab
Boaz First Baptist Church	Place of Refuge	225 South Main Street	Boaz
Douglas First Baptist Church	Place of Refuge	110 Moon Rd	Douglas
Gilliam Springs Baptist Church	Place of Refuge	1351 N Brindlee Mtn. Pkwy	Arab
Oak Grove United Methodist Church	Place of Refuge	Oak Grove Rd	Horton
St Williams Catholic Church	Place of Refuge & WC	929 Gunter Ave	Guntersville
Union Grove Senior Citizens Center	Place of Refuge	3935 Union Grove Rd	Union Grove
Albertville Public Library	Warm-cool	200 Jackson St	Albertville
Arab Church of Christ	Warm-cool	1005 N Main St	Arab
Arab Public Library	Warm-cool	325 2nd St NW	Arab
Arab Recreation Center	Warm-cool	761 N Main Street	Arab
Boaz Public Library	Warm-cool	404 Thomas Ave	Boaz
Boaz Recreation Center	Warm-cool	314 North King Street	Boaz

Name / Location	Type	Address	City / Town
Boaz Senior Center	Warm-cool	112 South Church Street	Boaz
Church of the Epiphany	Warm-cool	1101 Sunset Dr	Guntersville
Douglas Senior Center	Warm-cool	335 Stadium Cir	Horton
First Baptist Church Boaz	Warm-cool	225 Main St	Boaz
First Baptist Church Albertville	Warm-cool	309 E Main	Albertville
First Baptist Church Guntersville	Warm-cool	1000 Gunter Ave	Guntersville
First United Methodist Church Albertville	Warm-cool	204 Madison St	Albertville
First United Methodist Church Arab	Warm-cool	1058 N Main St	Arab
Guntersville Public Library	Warm-cool	1240 Obrig Ave	Albertville
Guntersville Senior Center	Warm-cool	1500 Sunset Dr	Guntersville
Lake City Assembly of God	Warm-cool	5025 Spring Creek Dr	Guntersville
Martling Friendship Center	Warm-cool	4059 Martling Rd	Albertville
Mt. Vernon Baptist Church	Warm-cool	2650 Pine St	Albertville

There are many communication towers throughout Marshall County to provide the citizens of the county with television, radio, and cell phone access.

Map 5-55. Marshall County Communication Towers

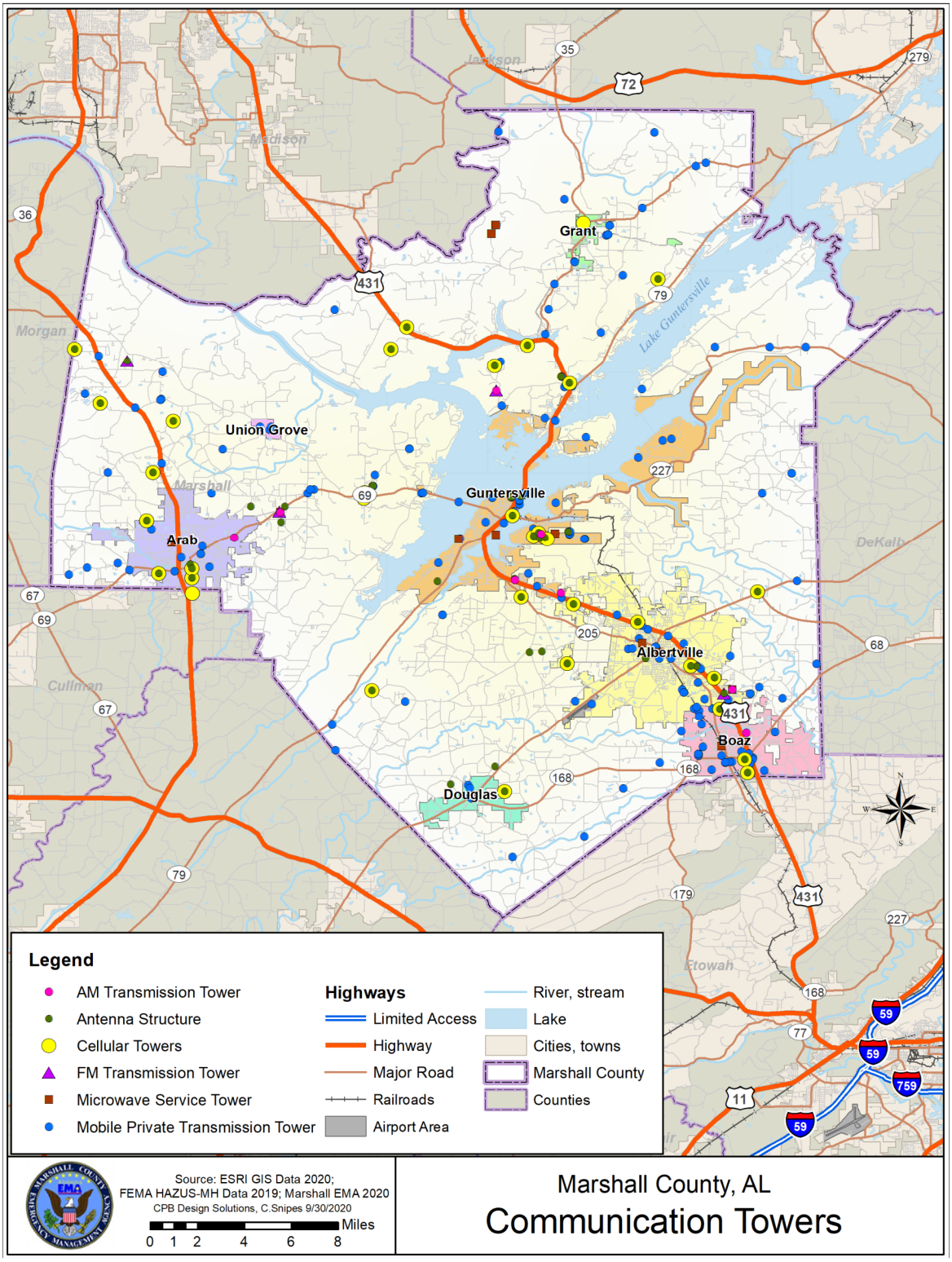


Table 5-39. Marshall County Communication Facilities

Company	Type	Address	City
AAA Communications	Wireless Communication	12985 US Highway 431	Guntersville
American Hazmat Response	Wireless Communication	251 Evermore Ln	Arab
Bellsouth	Wireless Communication	1121 Kilpatrick Rd	Albertville
Cingular Wireless	Wireless Communication	2081 US Highway 431	Boaz
Cingular Wireless	Wireless Communication	1004 Butler Ave	Boaz
Cingular Wireless	Wireless Communication	8337 US Highway 431	Albertville
Cingular Wireless	Wireless Communication	1077 N Brindlee Mountain	Arab
Cingular Wireless	Wireless Communication	1450 N Brindlee Mountain Pkwy	Arab
Cool-Com	Wireless Communication	1532 N Brindlee Mountain Pkwy	Arab
Corr Wireless	Wireless Communication	8180 Us Highway 431 # B	Albertville
Corr Wireless	Wireless Communication	1416 N Brindlee Mountain Pkwy	Arab
Wireless Advantage	Wireless Communication	2276 US Highway 431	Boaz
Wireless Advantage	Wireless Communication	8353 US Highway 431	Albertville
East Alabama Electronic Inc.	Wireless Communication	565 US Highway 431 B	Boaz
Farmers Wireless	Wireless Communication	2073 US Highway 431	Boaz
Suncom National Wireless	Wireless Communication	423 US Highway 431	Boaz
Verizon Wireless	Wireless Communication	11476 US Highway 431	Guntersville
Otelco	Telecommunications	113 South Main St	Arab
Charter Communications	Cable TV	904 Rose Rd	Albertville
Digital Satellite-Guntersville	Cable TV	46 Brown Acres	Guntersville
Southern Cable Services	Cable TV	10790 US Highway 431	Albertville
WAFN Radio FM 92.7 (Ch 224)	Radio Broadcasting	981 N Brindlee Mountain Pkwy	Arab
WAVU Radio FM 107.5, AM 630	Radio Broadcasting	3770 US Highway 431	Albertville
WBSA Radio AM 1300	Radio Broadcasting	1525 Wills Rd	Boaz
WGSV Radio AM 1270	Radio Broadcasting	2301 Thomas Ave	Guntersville
WJIA Radio FM 88.5 (Ch 203)	Radio Broadcasting	5025 Spring Creek Dr.	Guntersville
WQSB Radio FM 105.1	Radio Broadcasting	3770 US Hwy 431	Albertville
WRAB Radio AM 1380	Radio Broadcasting	619 S Brindlee Mountain Pkwy	Arab
WTWX Radio FM 95.9 (Ch 240)	Radio Broadcasting	2301 Thomas Ave	Guntersville
WWGC Radio AM 1090 Spanish	Radio Broadcasting	455 AL Hwy 75	Albertville
WZZN Radio FM 97.9	Radio Broadcasting	108 Woodson St - Huntsville	Union Grove

Marshall County maintains 61 warning sirens scattered throughout the county in order to alert citizens of significant weather events. The sirens are positioned so that citizens can hear the warnings while outside in order to have the best chance to prevent bodily harm in the event of severe weather.

Map 5-56. Marshall County Warning Sirens

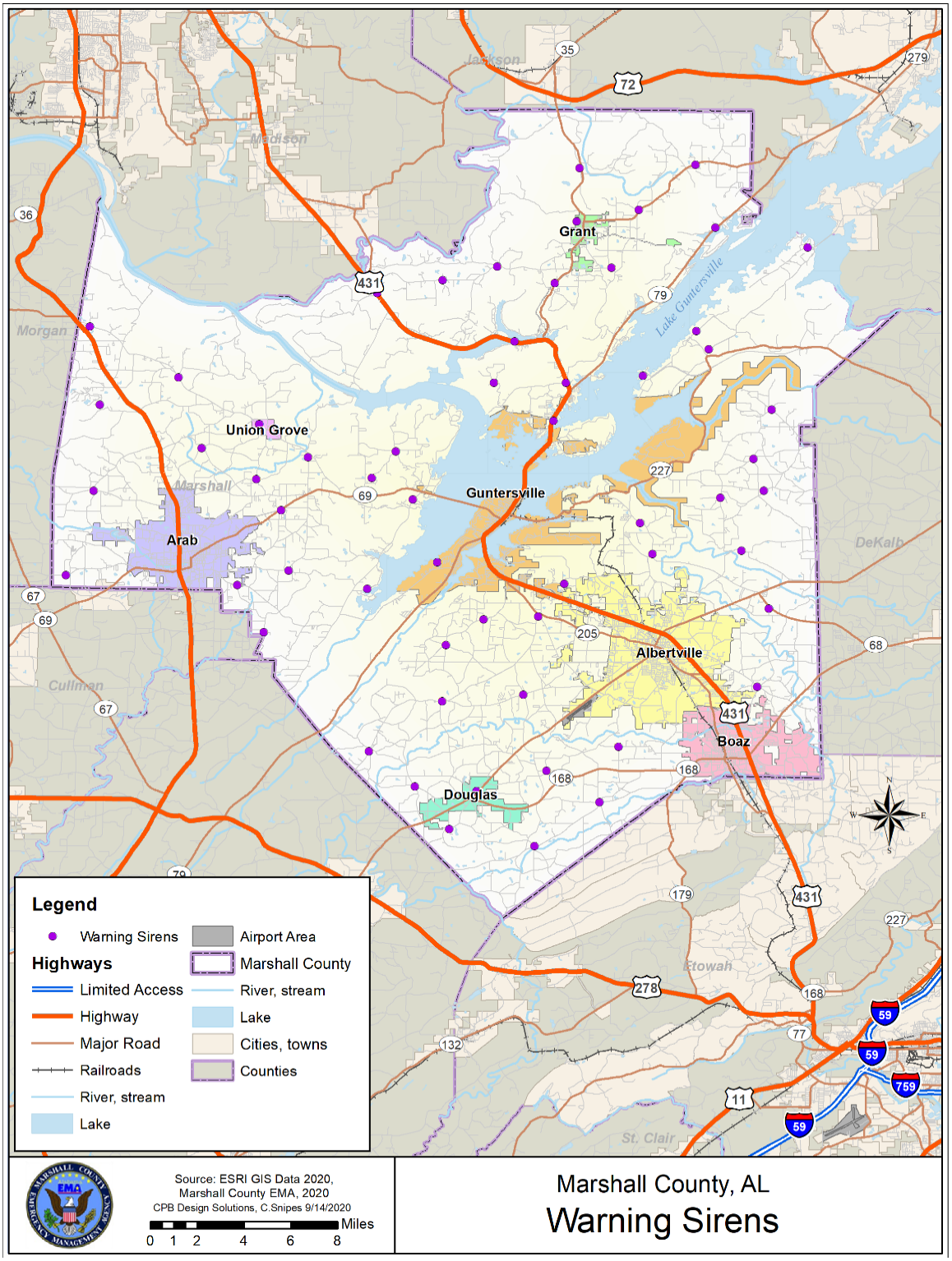


Table 5-40. Marshall County Warning Sirens

Current Siren #	Location
1001	Grant High School
1002	Douglas High School
1003	Claysville Elementary School
1004	Ball field across street Asbury High School
1005	Alder Springs Volunteer Fire Dept.
1006	Whitesville Dr./Sommerville Dr.
1007	Mt Hebron Volunteer Fire Dept.
1008	Pleasant Grove Rd/Byron Moman Rd
1009	Swearengin Volunteer Fire Dept.
1010	Poplar Springs Rd/Burgess Rd
1011	U.S. Hwy 431/Bakers Chapel Rd
1012	Waterfront Volunteer Fire Dept.
1013	U.S. Hwy 431/Boat launch near Snug Harbor Rd
1014	Hebron Volunteer Fire Dept.
1015	Nixon Chapel Volunteer Fire Dept.
1016	Beulah Volunteer Fire Dept.
1017	Pea Ridge Rd/ Between Puney Grove Rd and Martling Rd
1041	Guntersville Rescue Squad
1018	Simpson Point Rd/Anderson Ln
1019	Nixon Chapel Rd/Douglas-Hyatt Rd
1020	South Ridge Dr.
1021	Scant City Rd/Union Grove Rd
1022	Mt Carmel Rd/Rush Circle
1023	Brashiers Chapel Rd/Thompson Falls
1024	Al Hwy 69/Benton Rd
1025	Ruth Rd/Matt Morrow Rd
1027	Wakefield Volunteer Fire Dept.
1028	South Sauty Volunteer Fire Dept.
1029	Hulaco Rd/Norwood Dr.
1030	Union Grove Rd/Brocks Chapel Rd
1031	Warrenton Rd/Vaughn Circle
1032	Cathedral Caverns Hwy/Word Mtn. Rd
1033	Union Grove Rd/Royster Dr.
1034	Warrenton Rd/Warrenton Shores Dr.
1035	Cathedral Caverns Hwy/Kennamer Cove Rd
1036	Brashiers Chapel Rd/Fosset Rd
1037	Fry Gap Rd/Askea Grove Ln
1038	U.S. Hwy 68/McVille Rd
1039	Grimes Ln/Bohannon Rd

Current Siren #	Location
1040	Turnpike Rd/U.S. Hwy 205
1114	Intersection of Friendship Rd/New Friendship Rd
1115	Intersection of Mobb School Rd/Graceland Dr.
1116	Feemster Gap Rd near the intersection of Largo Lane
1117	Intersection of Georgia Mountain Rd/Foster Landing Rd
1211	Intersection of Welcome Home Rd/Campbell Rd
1212	Intersection of Simpson Point Rd/Kirkland Rd
1213	Intersection of US. Hwy 79N/Comfort Lane
1214	3550 Creek Path Road, Guntersville, AL
1215	Bakers Chapel Rd near Lewis Mtn. Rd Intersection
1216	Intersection of Swearengin Rd/Esslinger Rd
1309	Intersection of Hwy High Point Rd/Old Oneonta Rd
1310	Intersection of Kelly Rd/Pleasant Grove Rd
1311	Niles Rd near the intersection of Miller Dr.
1312	Intersection of Jackson Rd and Plum Dr.
1026	Union Grove Rd/Union Chapel
1313	Intersection of Mobb School Rd/Graceland Dr.
1410	Intersection of Hustleville Hwy/Rice Mill Chavers Rd
1411	Intersection of Martling Rd/Holly Lane
1412	Intersection of Claude Hill Rd/Ervin Patterson Rd
1413	Intersection of Milky Way Rd/Mizar Rd
1414	Murphy Hill Rd at the entrance to Mountain Lake Resort

There are dozens of utility facilities throughout Marshall County, including those for electricity, natural gas, solid waste, and water treatment. Facilities for all utilities are numerous in the more populated areas to provide better access for services. Sewer services are only available in Albertville, Arab, Boaz, and Guntersville. All other areas of the county rely on septic tanks.

Map 5-57. Marshall County Electrical Utility Facilities

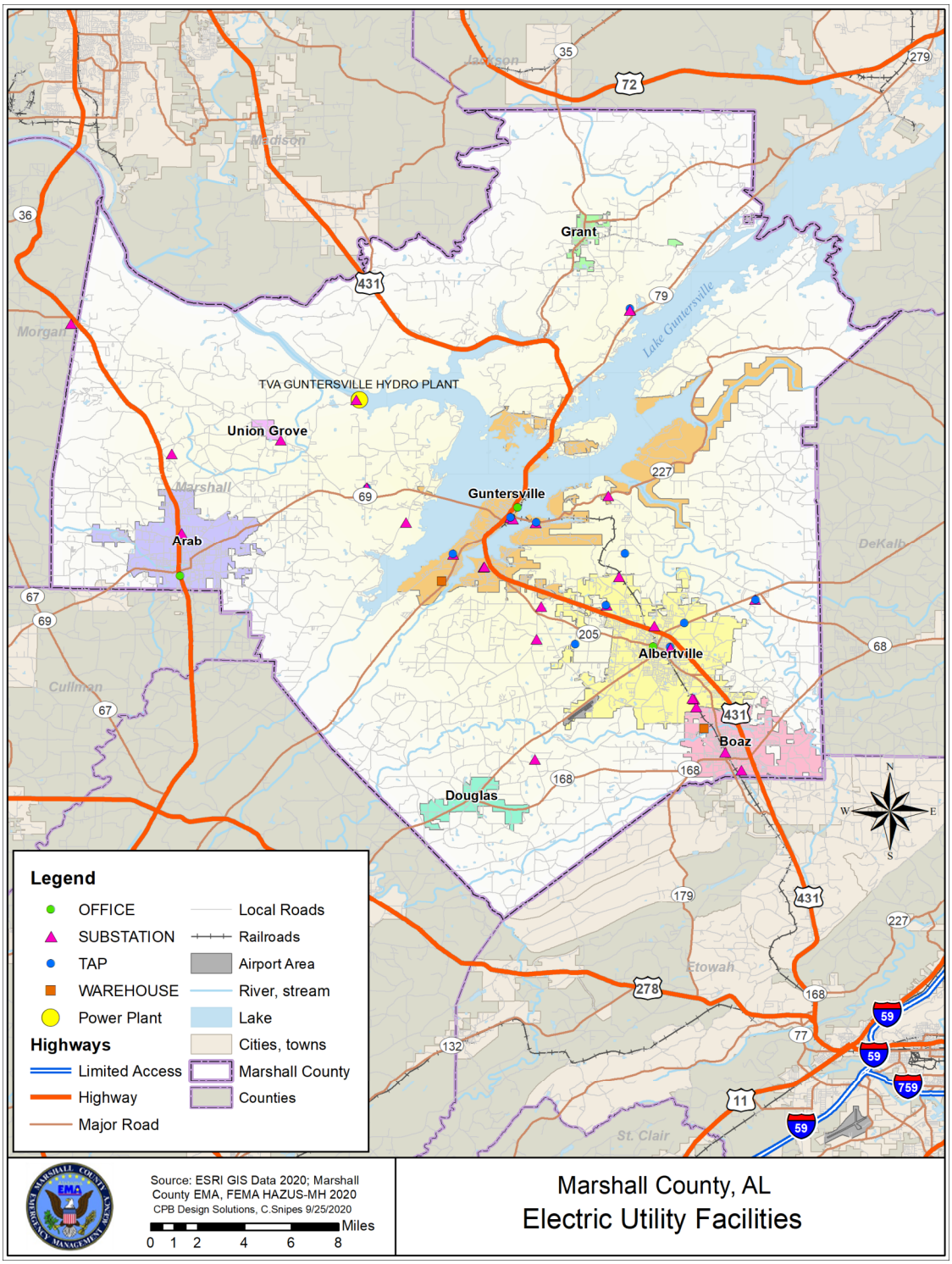


Table 5-41. Marshall County Utilities – Electric Facilities

Company	Type	Address	City
Arab Electric	Main Office	331 South Brindlee Mountain Parkway	Arab
Arab-Electric	Brindlee Substation	Substation Rd. (Morgan Co.-serves Marshall)	Arab
Arab-Electric	District Substation	North Main St	Arab
Arab-Electric	Georgia Mountain Substation	Georgia Mountain Road	Arab
Arab-Electric	Union Chapel Substation	Union Chapel Rd	Arab
Arab-Electric	Union Grove Substation	Union Grove Rd	Arab
Marshall Utility Board-Electric	Main Office	210 West Main	Albertville
MUB-Electric	District Substation	Teague St	Albertville
MUB-Electric	Mathis Mill Substation	Mathis Mill Rd	Albertville
MUB-Electric	Mueller Substation	Industrial Blvd	Albertville
MUB-Electric	North Substation (NAIB)	George Wallace Dr	Albertville
MUB-Electric	Primary Substation	Substation Rd	Albertville
Marshall-DeKalb Electric	Main Office	10025 Alabama 168	Boaz
MarDek EC	Boaz South Substation	Denson Rd	Boaz
MarDek EC	Cochran's Corner Substation	AL Hwy 75 N, behind Powell's Store	Boaz
MarDek EC	Horton Substation	Bethany Rd	Boaz
MarDek EC	Mt. High Substation	Red Barn Rd	Boaz
MarDek EC	Old Boaz Substation	Al Hwy 205/Emory Ave	Boaz
MarDek EC	Raymond Teal Substation	Oneonta Cut-Off Rd/Irvin Ln	Boaz
Guntersville Electric	Main Office	333 Gunter Avenue	Grant
Guntersville-Electric	Gerald Bryant Rd. Substation	Gerald Bryant Rd	Grant
Guntersville-Electric	Loveless St. Substation	Loveless St	Grant
Guntersville-Electric	Spring Creek Substation	Spring Creek Dr/GHS	Grant
Guntersville-Electric	Warrenton Rd. Substation	Warrenton Rd	Grant
Guntersville-Electric	Willow Beach Rd. Substation	Willow Beach Rd	Grant
Guntersville-Electric	Wyeth Dr. Substation	AL Hwy 227/Wyeth Dr	Grant

Company	Type	Address	City
No. Alabama Electric Coop	Main Office (serving Marshall County)	41103 U.S. 72	County
NALCOOP-E	Columbus City Substation	Substation Rd, off AL Hwy 79	County
NALCOOP-E	Larkinsville/Woodville Substation	Co. Rd. 30 by Co. Rd. 80 (Jackson Co.)	County
Huntsville Electric	Main Office (serving Marshall County)	112 Spragins St, 35801	County
Hunt-Nat Gas	Guntersville Gate Station	US Hwy 431/AL Hwy 79	County
Sand Mountain Electric	Main Office (serving Marshall County)	402 Main Street West	County
TVA Electric	Guntersville Hydro Plant / Dam	3464 Snow Point Rd	County

Map 5-58. Marshall County Gas and Solid Waste Facilities

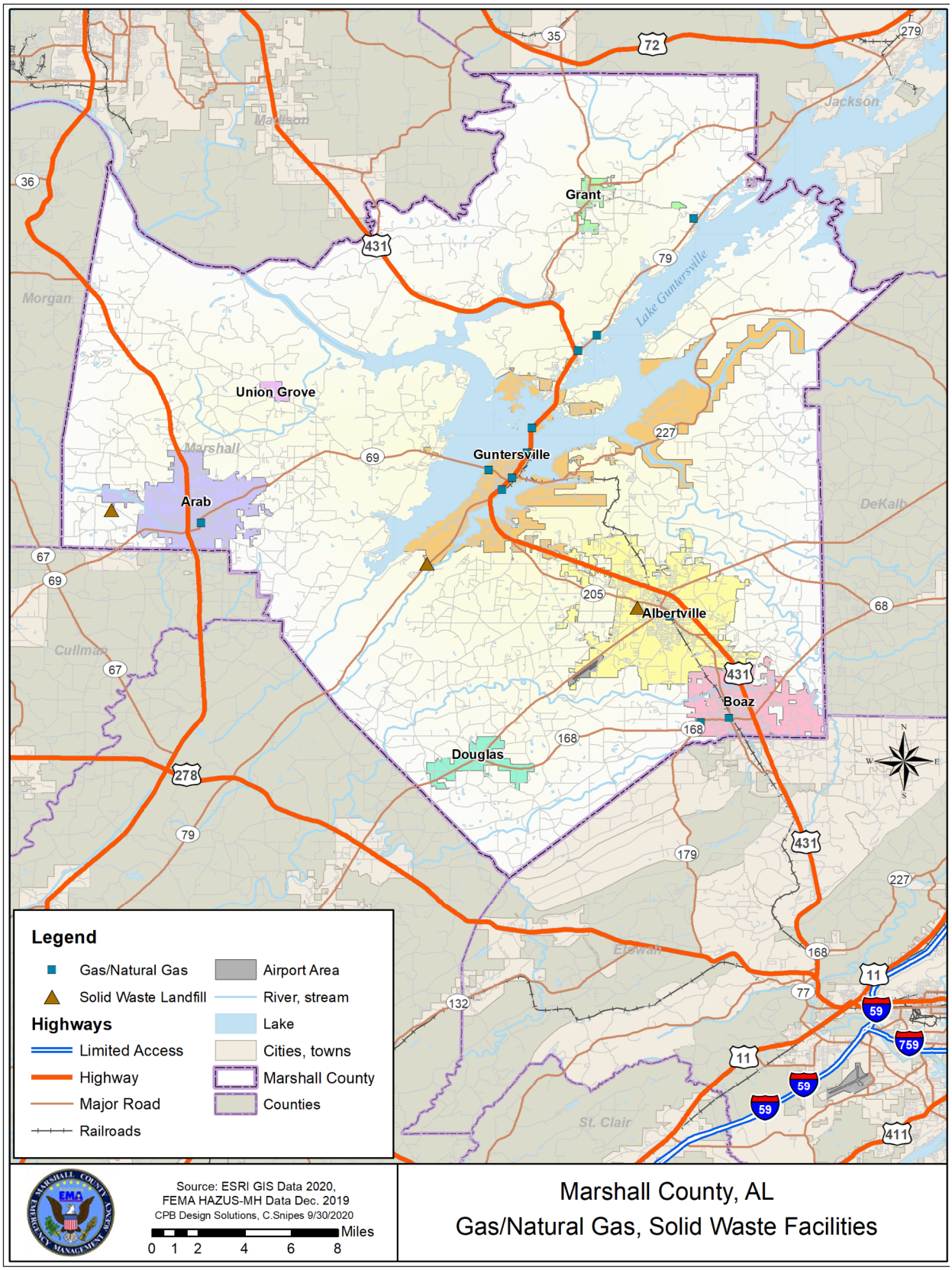


Table 5-42. Marshall County Utilities – Natural Gas and Solid Waste Facilities

Company	Type	Address	City
Boaz Gas Board	Main Office	138 N Main St, Boaz	Boaz
Boaz Gas Bd.	431 Gate Station	HWY 431 Near Faucett Motors	Boaz
Boaz Gas Bd.	Snellgrove Rd Gate Station	Snellgrove Rd and HWY 168	Boaz
Marshall County Gas	Main Office	1245 Gunter Ave	Guntersville
Mar Co Nat Gas	Albertville Gate Station	Neely Graham Ln	Guntersville
Mar Co Nat Gas	Arab Gate Station	Main St./Shoal Creek Trail	Guntersville
Mar Co Nat Gas	Douglas Gate Station	Al Hwy 79/US Hwy 278 (In Blount County)	Guntersville
Mar Co Nat Gas	Guntersville/Baker Mountain Gate Station	Baker Mountain Road, near AL Hwy 79	Guntersville
Mar Co Nat Gas	Guntersville/Fire Station	Blount Ave	Guntersville
Mar Co Nat Gas	Guntersville/Highway 79 Station	AL Hwy 79, near Convict Camp Rd	Guntersville
Mar Co Nat Gas	Guntersville/Lurleen Wallace Gate Station	Lurleen Wallace Dr/US Hwy 431	Guntersville
Mar Co Nat Gas	Guntersville/River Gate Station	US Hwy 431 S	Guntersville
Mar Co Nat Gas	Guntersville/Sunset Dr. Gate Station	Sunset Dr/AL Hwy 69	Guntersville
City of Albertville	Sanitary Inert Landfill	Al Hwy 79, near Convict Camp Rd	Albertville
City of Arab	C & D Landfill	1443 Hog Jaw Rd	Arab
City of Guntersville	Landfill	Alabama State Hwy 79 S	Guntersville

Map 5-59. Marshall County Potable Water and Wastewater Facilities

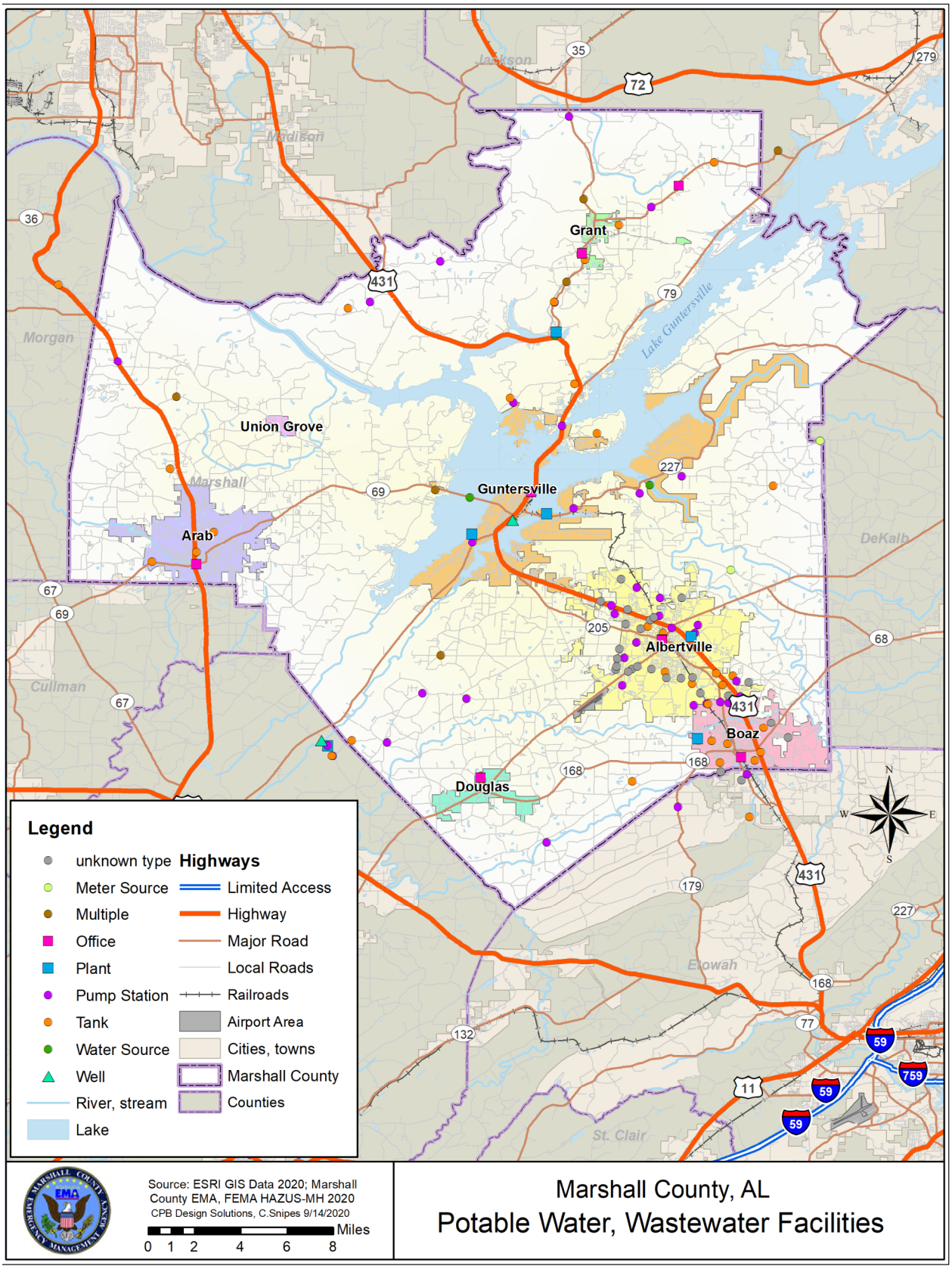


Table 5-43. Marshall County Utilities – Water and Wastewater Facilities

Company	Type	Address	City
Arab Water	Main Office	526 Cullman Rd Arab	Arab
Arab-Water	4th Ave. Tank	5th Ave NW	Arab
Arab-Water	12th Ave. Tank	12th Ave NE	Arab
Arab-Water	Arab Water Plant/Lift Station #1	66 Water Works Rd	Arab
Arab-Water	Armory Tank	AL 69/Hulaco Rd	Arab
Arab-Water	Deltacom Tank	Chambers Rd	Arab
Arab-Water	Morgan City Tank	US Hwy 231 (Morgan County)	Arab
Arab-Water	Mountain Gap Pump/Tank/Lift Station #2	Al Hwy 69	Arab
Arab-Water	Mountain View Tank & Pump	Mountain View Rd	Arab
Arab-Water	Raw Water Source	AL Hwy 69 Causeway (Guntersville)	Arab
Arab-Water	Terrell Hill Pump Station	US Hwy 231 N	Arab
Marshall Utility Board-Water	Main Office	210 W Main St	Albertville
MUB-Water	Incoming Point	Hwy 227	Guntersville
MUB-Water	Adams Tank	Adams Dr/US Hwy 431	Guntersville
MUB-Water	Alverson Tank	Alverson St/Bobo St	County
MUB-Water	Beulah Tank	Beulah Cut-Off Rd/Darden St	County
MUB-Water	Cahill Tank	Cahill Rd	County
MUB-Water	Drum Circle Pump #11	274 Drum Cir	Albertville
MUB-Water	East McKinney Pump #35	901 E. McKinney	Albertville
MUB-Water	Edmonson Pump #5	810 Edmonson St	Albertville
MUB-Water	George Wallace Pump #12	2700 George Wallace Dr	Albertville
MUB-Water	Gray Pump #1	Gray Rd	Albertville
MUB-Water	Huhtamaki Pump #27	608 Mathis Mill Rd	Albertville
MUB-Water	Leisure Acres Pump #14	Leisure Acres/Glassco Dr	Albertville
MUB-Water	Mary Tank	Mary St	Albertville
MUB-Water	McKinney Tank	McKinney/Hambrick St	Albertville

Company	Type	Address	City
MUB-Water	Plantation Pump #16	216 O'Hara Dr	Albertville
MUB-Water	Pine Tank	Pine St./First St	Albertville
MUB-Water	Turkey Pump #22	393 Corbinville Rd	Albertville
MUB-Water	US431/AL75 Pump #21	7155 US Hwy 431	Albertville
MUB-Water	US 431 North Pump	9610 US Hwy 431	Albertville
MUB-Water	Wagner Dr. Pump #25	Wagner Dr	Albertville
MUB-Water	Water Plant	600 Water Plant Rd	Albertville
MUB-Water	Whispering Pines Pump #7	1410 Ponderosa Ave	Albertville
MUB-Water	Westside Pump #9	713 Half Section Line Rd	Albertville
Boaz Water	Main Office	107 Billy Dyar Blvd	Boaz
Boaz-Water	Aurora Rd. Tank	Aurora Rd (Etowah County)	Boaz
Boaz-Water	Blanche Dr. Pump	Blanche Dr	Boaz
Boaz-Water	Collier St. Tank	Collier St	Boaz
Boaz-Water	Elder St. Tank	Elder St./Usry St	Boaz
Boaz-Water	Henderson Rd. Pump	Henderson Rd Pump	Boaz
Boaz-Water	Julietta St. Pump	Julietta St	Boaz
Boaz-Water	King St. Tank	King St	Boaz
Boaz-Water	McVille Rd. Tank	McVille Rd/Old Crossville Rd	Boaz
Boaz-Water	Snead St. Tank	Snead St	Boaz
Boaz-Water	US 431 Tank	US Hwy 431 N (Behind Guthrie's)	Boaz
Boaz-Water	Wagner Dr. Pump	Wagner Dr./Industrial Blvd	Boaz
Boaz-Water	Wagner Dr. Tank	Wagner Dr./Industrial Blvd	Boaz
Douglas Water	Main Office	550 Bethlehem Rd	Douglas
DOUG-W	Filter Plant	Located in Blount County	Douglas
DOUG-W	Plant Pump House	Located in Blount County	Douglas
DOUG-W	Pump Station #1	Located in Blount County	Douglas
DOUG-W	Pump Station #2	Nixon Chapel Rd	Douglas

Company	Type	Address	City
DOUG-W	Pump Station #3	AL Hwy 168/New Hope Rd	Douglas
DOUG-W	Pump Station #6	Horton-Nixon Chapel Rd	Douglas
DOUG-W	Pump Station #8	Wind Mill Rd	Douglas
DOUG-W	Tank #1	*Blount County*	Douglas
DOUG-W	Tank #2, Tank #7, Pump #7	Section Line Road	Douglas
DOUG-W	Tank #3	Bethlehem Rd	Douglas
DOUG-W	Tank #4	Forrest Home Rd	Douglas
DOUG-W	Tank #6	Formby Rd./Bethlehem Rd	Douglas
DOUG-W	Tank #8	Big Spring Brow Rd	Douglas
DOUG-W	Wells 1-3	Located in Blount County	Douglas
DOUG-W	Pump Station #4	Highpoint Rd and McAllister Rd	Albertville
DOUG-W	Pump Station #5	Al Hwy 179 and Glover Rd	Boaz
North Marshall Utilities	Main Office	4141 Cathedral Caverns Hwy	Grant
NMARU-W	Grant Elevated Tank	Cathedral Caverns Highway/Near Downtown	Grant
NMARU-W	Grant Park Tank	Park Rd., Near Fire Tower Rd	Grant
NMARU-W	Gunter's Landing Tank	End of Gunter's Landing Rd	Grant
NMARU-W	Guntersville Airport Pump	US Hwy 431 N/Bakers Chapel Rd	Grant
NMARU-W	Jim Tom Hodges Rd. Pump	Jim Tom Hodges Rd/Cathedral Caverns Hwy	Grant
NMARU-W	Kennamer Cove Pump & Tank	Cathedral Caverns Highway	Grant
NMARU-W	Lewis Mountain Pump	Lewis Mountain Rd	Grant
NMARU-W	Lewis Mountain Tank	Lewis Mountain Rd	Grant
NMARU-W	Merrill Mountain Pump	Merrill Mountain Rd	Grant
NMARU-W	Merrill Mountain Tank	Merrill Mountain Circle	Grant
NMARU-W	Mountain Side Pump	Word Mountain Rd	Grant
NMARU-W	Mountain Side Tank	Word Mountain Rd	Grant
NMARU-W	Mountain Top Pump & Tank	Word Mountain Rd/Cathedral Caverns Hwy	Grant
NMARU-W	Raw Water Source	Word Mountain Rd, south of water plant	Grant

Company	Type	Address	City
NMARU-W	Shin Point Pump	Shin Point Rd	Grant
NMARU-W	Valley Water Tank	Bakers Chapel Rd	Grant
NMARU-W	Water Plant	Word Mountain Rd	Grant
Guntersville Water / Sewer	Main Office	329 Gunter Ave	Guntersville
Guntersville Water	Little Mountain Pump Station	Al Hwy 227, near Signal Point Rd	Guntersville
Guntersville Water	Indian Hills Pump Station	Sequoyah Ln., near AL Hwy 79	Guntersville
Guntersville Water	Sunset Dr. Water Plant	Sunset Dr./Willow Beach Rd	Guntersville
Guntersville Water	Well #1	Blount Ave, next to Kirkpatrick Concrete	Guntersville
North East AL Water	Main Office (serving Marshall County)	2416 Beck Industrial Blvd NW	County
NEAL-WW	Cochran's Corner Pump	AL Hwy 75, North Scarham Creek Bridge	County
NEAL-WW	Double Bridges Pump	Beulah Rd, near AL Hwy 168	County
Swearengin Water	Main Office (serving Marshall County)	5100 Swearengin Rd	County
SWEAR-W	Grant Pump	Swearengin Rd./Esslinger Rd	County
SWEAR-W	Scottsboro Tank & Pump	Swearengin Rd (Jackson Co.)	County
SWEAR-W	Willmon Rd. Tank	Swearengin Rd/Willmon Rd	County
Union Grove Water	Main Office	3680 Union Grove Rd	Union Grove
UGUB-W	Pritchett Dr. Tank	Pritchett Dr	Union Grove
UGUB-W	Pump Station	Union Grove Rd, near Mountain View Rd	Union Grove
UGUB-W	Union Grove Water Tank	Union Grove Rd	Union Grove
Arab Sewer	Main Office	526 Cullman Rd Arab	Arab
Marshall Utility Board-Sewer	Main Office	210 W Main St	Albertville
MUB-Sewage	Arbor Acres	Arbor Acres Rd/Hwy 431	Albertville
MUB-Sewage	Broadway Estates	Bowery Ln	Albertville
MUB-Sewage	Circle Dr. #18	Circle Dr	Albertville
MUB-Sewage	Country Club #13	135 Wildhaven Dr	Albertville
MUB-Sewage	Dairy Queen #34	US Hwy 431	Albertville
MUB-Sewage	Feed Mill #10	Railroad Ave	Albertville

Company	Type	Address	City
MUB-Sewage	Floyd Dr. #29	Floyd Dr	Albertville
MUB-Sewage	Hickory St. #4	Hickory St	Albertville
MUB-Sewage	Hwy 75 #24	AL Hwy 75/Brock St	Albertville
MUB-Sewage	Hwy 75 #23	AL Hwy 75/O'Hara Dr	Albertville
MUB-Sewage	Indian Trails #30	Cherokee Dr	Albertville
MUB-Sewage	Industrial Park #3	Industrial Blvd	Albertville
MUB-Sewage	Little Drum	130 Quality Dr	Albertville
MUB-Sewage	Lowery St. #33	Little Tree Rd	Albertville
MUB-Sewage	Mitchell #6	401 Mitchell Ave	Albertville
MUB-Sewage	Pine St. #15	Pine St	Albertville
MUB-Sewage	Rec. Center	Wendy Ln	Albertville
MUB-Sewage	Shaw St. #36	Shaw St	Albertville
MUB-Sewage	Solitude #8	401 Solitude Ave	Albertville
MUB-Sewage	South Broad St. #26	South Broad St	Albertville
MUB-Sewage	Terra Pine Pump #17	Terra Pine St	Albertville
MUB-Sewage	Timber Lane #31	Timber Lane	Albertville
MUB-Sewage	Wastewater Plant	901 E. McKinney	Albertville
MUB-Sewage	Waylon St. #19	Edmonson St./Waylon St	Albertville
Boaz Sewer	Main Office	107 Billy Dyar Blvd	Boaz
Boaz-Sewer	Bruce Rd.	Bruce Rd	Boaz
Boaz-Sewer	King St.	King St	Boaz
Boaz-Sewer	Martin Rd.	Martin Rd	Boaz
Boaz-Sewer	Pleasant Hill Rd.	Pleasant Hill Rd	Boaz
Boaz-Sewer	Treatment Plant	College Ave	Boaz
Guntersville Water / Sewer	Main Office	329 Gunter Ave	Guntersville
Guntersville Sewer	Eastlake Wastewater Plant	AL Hwy 227/behind Gold Kist	Guntersville
Guntersville Sewer	Sewer Lift #1	Al Hwy 227/Railroad Ave	Guntersville

Company	Type	Address	City
Guntersville Sewer	Sewer Lift #2	Sunset Dr/Near Carlisle School	Guntersville
Guntersville Sewer	Sewer Lift #3	Lakeshore Dr	Guntersville
Guntersville Sewer	Sewer Lift #8	Wyeth Dr/Launch St	Guntersville
Guntersville Sewer	Sewer Lift #13	Wyeth Dr/Near AL Hwy 227	Guntersville
Guntersville Sewer	Lift Station #16	Morrow Street	Guntersville

The largest and most significant of Marshall County's several dams is the Guntersville Lock and Dam, operated by the TVA. This dam is almost 4,000 ft long and creates Lake Guntersville which is very important to the economy of the County. The other dams are located around the county on various tributaries of the Tennessee River. The levee is located in Guntersville Lake in Guntersville.

Map 5-60. Marshall County Dams and Levee

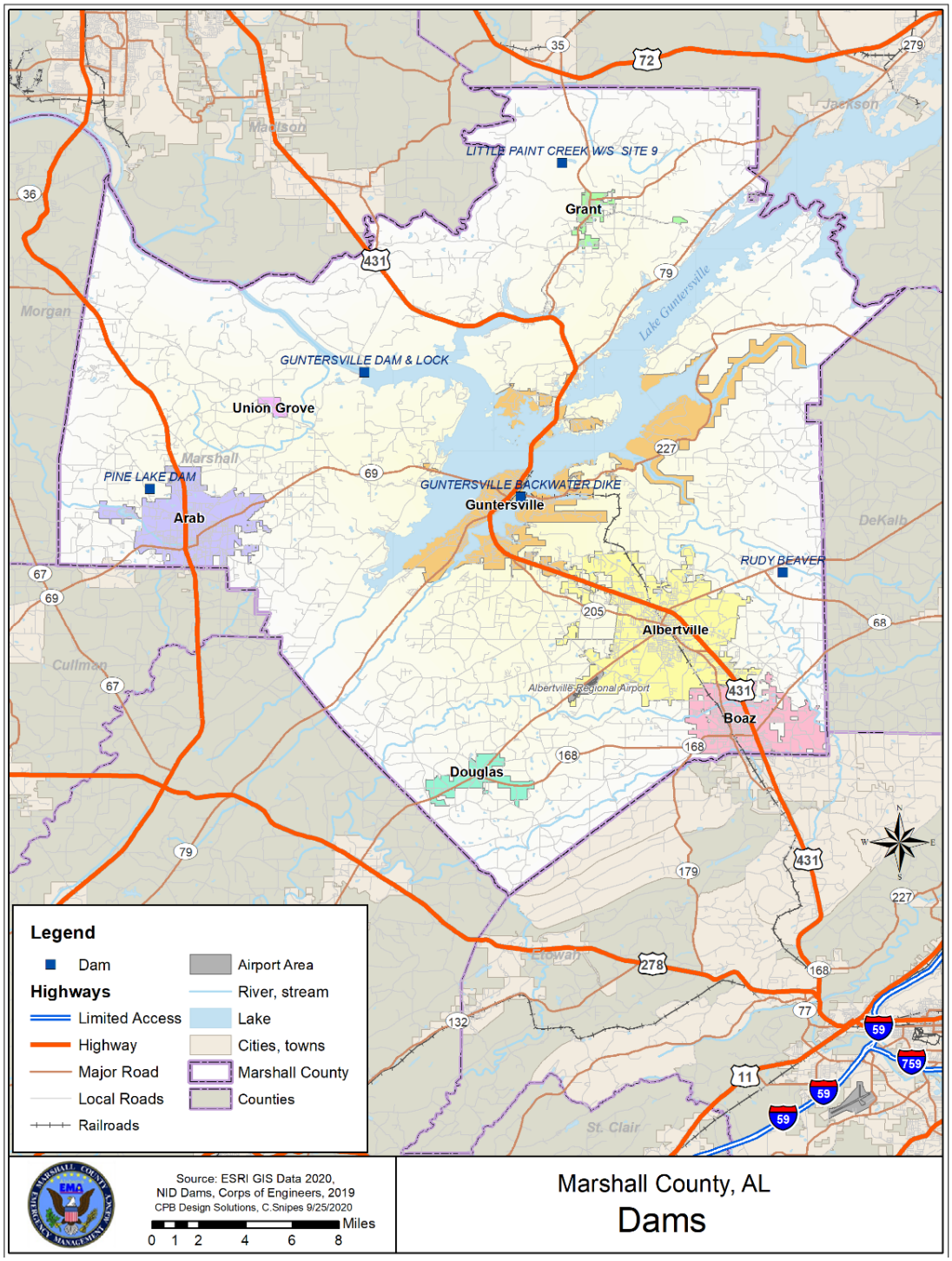
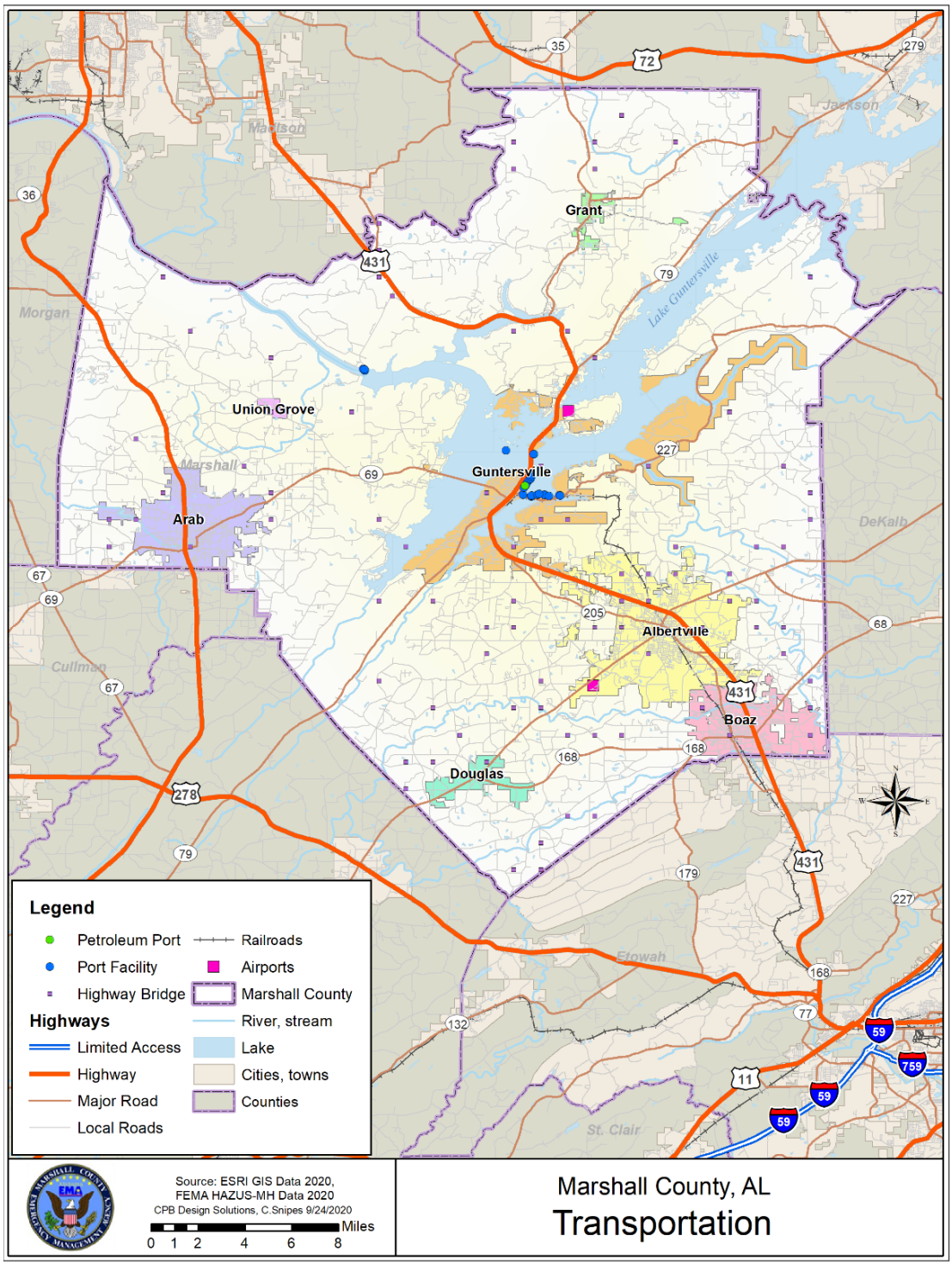


Table 5-44. Marshall County Dams and Levees

Name	Owner	River	Dam Length (Ft.)	Dam Height (Ft.)	Max Discharge (ft^3/s)	Max Storage (Acre ft)
Guntersville Lock and Dam	TVA	Tennessee River	3,979	78	650,000	1,049,000
Pine Lake Dam	Sid McDonald	Gilliam Creek	680	0	2,675	473
Little Paint Creek Lake Dam 9	Richard Woodall	Little Paint Creek	798 598	26 28	1,060	950
Rudy Beaver	Rudy Beaver	TR – Scarham Creek	260	30	700	104
Reedy Morris	Reedy Morris	TR - Short Creek	400	32	83	99
Guntersville Levee	TVA	Tennessee River	12,585	39	-	-

Two US highways run through Marshall County, US 431 and 231, as well as 8 state highways. Because of Lake Guntersville, Marshall County has water travel so there are ports near Guntersville Lake Dam and several near Big Spring Creek. There are also two airports; one in Guntersville and one in Albertville.

Map 5-61. Marshall County Transportation Infrastructure



Map 5-62. Marshall County Port Facilities Detail

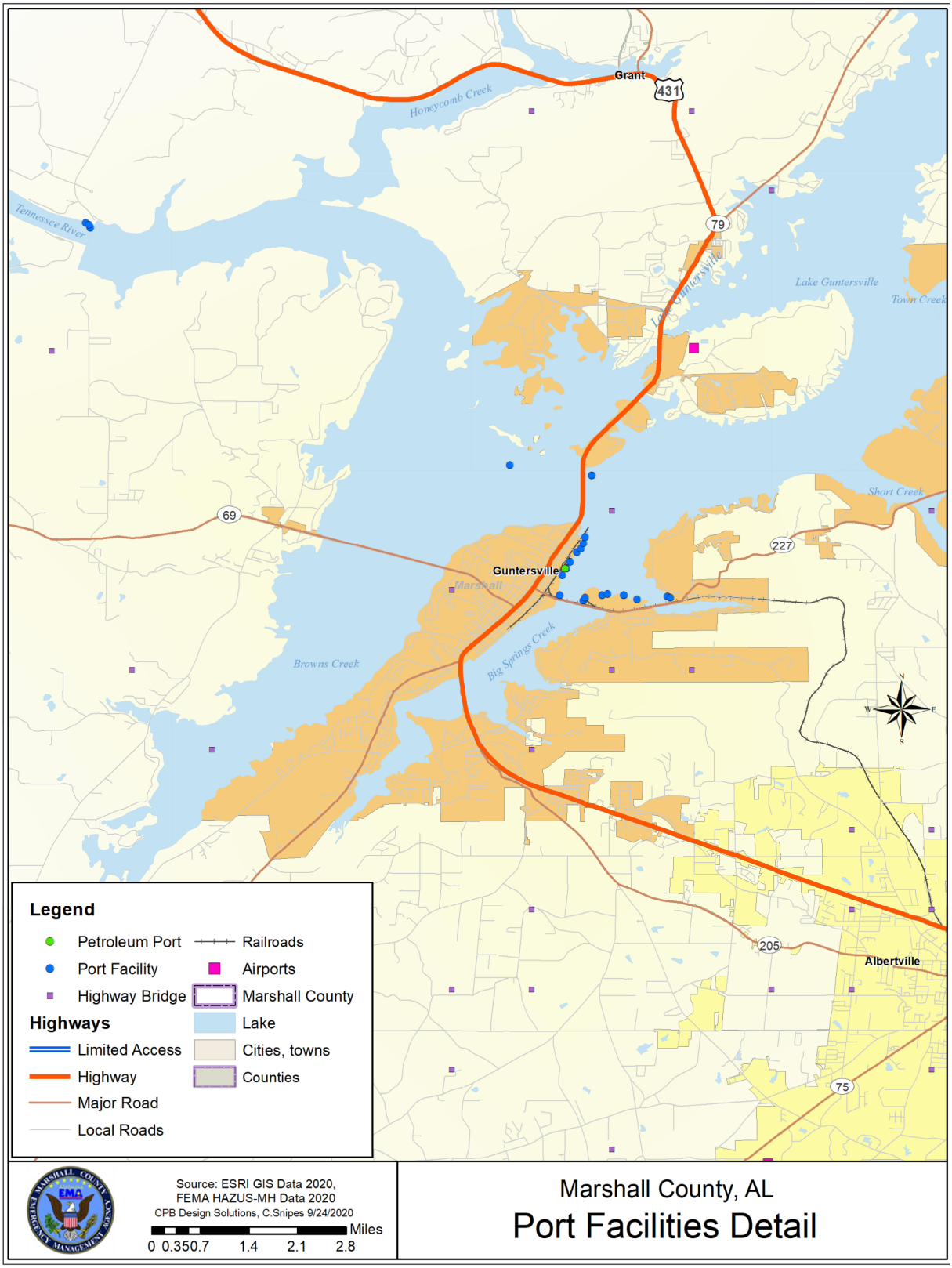


Table 5-45. Port Facilities

Name	Type	Address	City
Cargill Marketing Co., Guntersville North Wharves	Dock	200 Taylor Street.	Guntersville
Cargill North America Oilseed Processing Co., Docks	Dock (3)	2930 Lake Guntersville Park Dr.	Guntersville
Gold Kist Guntersville Poultry Feed Mill Dock (Grn)	Dock	2950 Lake Guntersville Park Dr.	Guntersville
Guntersville Marine Docks (2)	Dock	3700 Lake Guntersville Park Dr.	Guntersville
Gold Kist, Guntersville Feed Mill Dock	Dock	4800 Lake Guntersville Park Dr.	Guntersville
Warren Distribution Inc., Southeast Lube Facility	Dock	East end of Worth Street.	Guntersville
American Commercial Terminals, Port of Guntersville, Dump Ramp Dock.	Dock	Foot of Scott Street.	Guntersville
Watco Bulk Terminals (Port of Guntersville)	Dock	Foot of Scott Street.	Guntersville
American Commercial Terminals, Port of Guntersville	Dock (2)	Foot of Worth Street.	Guntersville
Cargill Marketing Co., Guntersville South Wharves	Dock	Railroad Avenue and Brown St.	Guntersville
The Great Combine, Guntersville Grain Transfer Whf	Dock	Railroad Avenue.	Guntersville
Consolidated Blenders, Guntersville Dock	Dock	Signal Road.	Guntersville
Guntersville Locks (2)	Lock Chamber	3780 Guntersville Dam Rd	Grant
Guntersville Lock & Dam	Lock and/or Dam	Guntersville Dam Rd	Grant
Alabama Farmers Cooperative, Inc. Wharves, Guntersville	Dock	2414 Brown St	Guntersville
Guntersville Marine Docks	Dock	100 Marina Ln	Guntersville
Kiwanis Pier	Dock	Wyeth Dr	Guntersville
American Commercial Term Port of Guntersville	Dock	2551 Worth St	Guntersville
Alabama Farmers Cooperative, Inc. Grain Elevator Wharf	Dock	2414 Brown St	Guntersville
Port of Guntersville, Al	Petroleum Port	2551 Worth St	Guntersville

Marshall County has a total of 116 bridges. The bridges in Marshall County are impacted by a number of hazards and many of the aging structures are approaching the need for replacement. Over half of the bridges were built prior to 1960 and nine of those were built in the 1920's. Twelve of the bridges located in Marshall County are owned by individual jurisdictions, 77 by the county and 26 by the state.

Table 5-46. Marshall County Bridges

Name	Owner	Year Built
SR 205	State Highway Agency	1923
SR 205	State Highway Agency	1923
County Hwy 1175	County Highway Agency	1925
County Hwy 1063	County Highway Agency	1925
County Hwy 1140	County Highway Agency	1925
Old 431 Hwy	Town Highway Agency	1927
Butler Mill Rd	County Highway Agency	1927
SR 69	State Highway Agency	1927
Old 431 Hwy	Town Highway Agency	1928
Forman Bottom Road	County Highway Agency	1930
Co Rd # 547	County Highway Agency	1930
Co Rt 63	County Highway Agency	1935
County Hwy 1378	County Highway Agency	1936
County Hwy 1009	County Highway Agency	1938
County Hwy 1009	County Highway Agency	1938
County Hwy 1247	County Highway Agency	1938
County Hwy 1251	County Highway Agency	1938
County Hwy 1283	County Highway Agency	1938
County Hwy 1847	County Highway Agency	1938
County Hwy 1176	County Highway Agency	1938
US431	State Highway Agency	1938
SR 227	State Highway Agency	1938
SR 227	State Highway Agency	1938
County Hwy 1324	County Highway Agency	1938
County Hwy 1291	County Highway Agency	1938
County Hwy 1064	County Highway Agency	1938
County Hwy 109	County Highway Agency	1938

Name	Owner	Year Built
County Hwy 1003	County Highway Agency	1938
County Hwy 1137	County Highway Agency	1938
County Hwy 1139	County Highway Agency	1938
County Hwy 1141	County Highway Agency	1938
County Hwy 1178	County Highway Agency	1938
County Hwy 1106	County Highway Agency	1938
Lock Access Road	Tennessee Valley Authorit	1939
SR 69	State Highway Agency	1941
SR 75	State Highway Agency	1942
College Ave	City Highway Agency	1942
Co . Rt. 73	County Highway Agency	1943
00000	County Highway Agency	1943
SR 75	State Highway Agency	1947
SR 168	State Highway Agency	1948
County Road 1075	County Highway Agency	1950
County Hwy 1562	County Highway Agency	1951
County Hwy 1568	County Highway Agency	1951
County Hwy 1010	County Highway Agency	1951
Unpaved Road	County Highway Agency	1951
County Hwy 1213	County Highway Agency	1951
Co Rd 1197	County Highway Agency	1951
County Hwy 1322	County Highway Agency	1951
County Hwy 1409	County Highway Agency	1951
County Hwy 1409	County Highway Agency	1951
County Hwy 1415	County Highway Agency	1951
County Hwy 1415	County Highway Agency	1951
Kuykendall Road	City Highway Agency	1951
County Road 400	County Highway Agency	1951
County Hwy 1166	County Highway Agency	1951
County Hwy 1300	County Highway Agency	1951
County Hwy 1101	County Highway Agency	1951
County Hwy 1128	County Highway Agency	1951
County Hwy 1131	County Highway Agency	1951

Name	Owner	Year Built
County Hwy 1131	County Highway Agency	1951
US431; SR 1	State Highway Agency	1957
US431; SR 1	State Highway Agency	1957
US431; SR 1	State Highway Agency	1957
County Hwy 1372	County Highway Agency	1957
Co Rd 1296	County Highway Agency	1958
Paint Rock Rd	County Highway Agency	1959
County Hwy 1409	County Highway Agency	1960
County Hwy 1422	County Highway Agency	1960
County Hwy 1133	County Highway Agency	1960
County Hwy 1414	County Highway Agency	1962
Co . Rt. 30	County Highway Agency	1963
County Hwy 1079	County Highway Agency	1964
County Road 1669	County Highway Agency	1965
County Hwy 1127	County Highway Agency	1965
County Road 1373	County Highway Agency	1965
County Road 1024	County Highway Agency	1968
County Road 75a	County Highway Agency	1970
Pine Lake Dr	City Highway Agency	1973
Cochran Ave	City Highway Agency	1974
US72; SR 2	State Highway Agency	1975
US72; SR 2	State Highway Agency	1975
Co Rd 1005	County Highway Agency	1975
East Mckinney	City Highway Agency	1975
County Hwy. 1005	County Highway Agency	1977
US431; SR1; SR79	State Highway Agency	1977
1/2 Section ln Rd	City Highway Agency	1980
Rose Rd.	City Highway Agency	1981
Co Rd 1344	County Highway Agency	1984
Wyeth Dr	City Highway Agency	1985
Wolf Creek Rd.	City Highway Agency	1985
County highway156	County Highway Agency	1986
Unpaved County Road	County Highway Agency	1986

Name	Owner	Year Built
County Hwy 145	County Highway Agency	1986
County Hwy 146	County Highway Agency	1987
County Hwy 64	County Highway Agency	1987
County Hwy 1543	County Highway Agency	1989
County Hwy 1005a	County Highway Agency	1990
SR53	State Highway Agency	1990
Co Rd 1235	County Highway Agency	1991
Co Hwy 24	County Highway Agency	1991
County Hwy 1014	County Highway Agency	1993
US431; SR1; SR79	State Highway Agency	1994
SR 75	State Highway Agency	1995
County Hwy 1206	County Highway Agency	1995
Ped Walk Cath Cav	State Highway Agency	1996
US431	State Highway Agency	1996
US431	State Highway Agency	1996
Co Rd 1483a	County Highway Agency	1996
US431	State Highway Agency	1997
George Wallace Drive	City Highway Agency	1997
Park Road	County Highway Agency	1998
US431, SR1	State Highway Agency	1998
SR 227	State Highway Agency	2000
SR 227	State Highway Agency	2000
County Hwy 1123	County Highway Agency	2000

Table 5-47. Marshall County Airports

NAME	Address	City
Albertville Municipal Airport	300 Alldredge Dr	Albertville
Guntersville Municipal Airport	Joe Starnes Field	Guntersville

5.5 Estimate of Dollar Losses to Vulnerable Structures

This section provides estimates of damages to vulnerable structures identified in Section 5.4. Loss estimates are calculated using the structure, contents, and function of each asset. The following definitions and calculations are used for loss estimation.

- ✓ Structure loss – percent damage multiplied by the replacement value of the structure.
- ✓ Content loss – percent damage multiplied by the replacement value of the contents.
- ✓ Functional loss - indirect effects of the hazard, such as the days of interruption in operations that an asset incurs during an event.

When calculating loss estimates for hazards with existing damage records, we utilize loss estimates from the most probable severity. If a hazard effects a certain location, like landslides, the loss estimate will evaluate structures with that location. These loss estimates are not precise; however, they can provide the user with a rough estimate on the benefits of a mitigation project and they can also assist within the selection and prioritization of mitigation measures for the jurisdictions. While the previous sections addressed future values, the damage estimates in this section only apply to existing conditions.

Table 5-48 shows the overall building inventory for the study area as a reference for the scenarios run by Hazus-MH.

Table 5-48. Building Inventory by Occupancy

Occupancy	Value ($1000)	Percent of Total Value
Residential	6,199,020	74.35%
Commercial	1,277,354	15.32%
Industrial	535,030	6.42%
Agricultural	35,229	0.42%
Religious	156,807	1.88%
Government	50,931	0.61%
Education	83,761	1.00%
Total	$8,338,132	100.00%

5.5.1 Loss Estimate Methodology

Three methods of data collection were used to estimate the economic and structural losses due to hazards in Marshall County. One source was the program Hazus-MH. Hazus is a computer program developed by FEMA and the National Institute of Building Sciences that models hazard events and maps out their impact on a region. Hazus-MH uses approximations and algorithms to estimate losses, so results do not reflect actual losses with certainty. These loss estimates are most useful for judging a hazard's risk relative to other hazards and the vulnerability

of a structure relative to other structures, rather than as absolute measures of likelihood and economic appraisal.

There are three levels of analysis within Hazus and the accuracy of the data increases with the level of analysis. For this plan, a level 1 analysis was run which utilizes the national data set that was provided with Hazus-MH. Numbers provided in the Hazus-MH reports are not based on actual field inventories, which is beyond the scope of this planning process; however, the information provided through Hazus can still assist in the planning process. The analysis run by Hazus-MH for Marshall County provided general economic and structural loss estimates for hurricane winds, floods, and earthquakes. Hazus-MH provides data at the county level. Jurisdictional values were extrapolated using the county data.

The second method for estimating loss was researching past events. Historical records of past events were researched, and the data was applied where applicable. The following data sets and records were referenced:

1. NFIP insurance claims data since 1978.
2. NOAA, National Climatic Data Center damage assessments.
3. National Weather Service Alabama Tornado database.
4. Alabama State Hazard Mitigation Plan, 2018 update, Section 3.3 "Vulnerability Assessment and Loss Estimation."

The final method was calculating losses across the jurisdictions based on population, numbers of structures in an area, and exposure to the hazards by jurisdiction.

5.5.2 Hazus-MH Loss Estimates

Hazus-MH analyses were conducted by a qualified GIS professional with advanced Hazus training. The analyses that were run for this plan included hurricane, flood, and earthquake scenarios. One hundred- and five-hundred-year probability of return analyses were performed for hurricanes and earthquakes and the one-hundred-year flood event was used for the flood analysis. The following Hazus-MH reports are on file with the Marshall County EMA and available for public review:

- Hazus-MH: Hurricane Global Risk Report, August 31, 2020
  Scenario – 100 Year Return Period
- Hazus-MH: Hurricane Global Risk Report, August 31, 2020
  Scenario – 500 Year Return Period
- Hazus-MH: Flood Global Risk Report, November 11, 2020
  Scenario – 100 Year Flood Event
- Hazus-MH: Quick Assessment Report, November 11, 2020
- Hazus: Earthquake Global Risk Report, August 13, 2020
  Scenario – Marshall 100 Year Earthquake (5.0 Magnitude) Probability

- Hazus: Earthquake Global Risk Report, August 13, 2020
  Scenario – Marshall 500 Year Earthquake (5.0 Magnitude) Probability

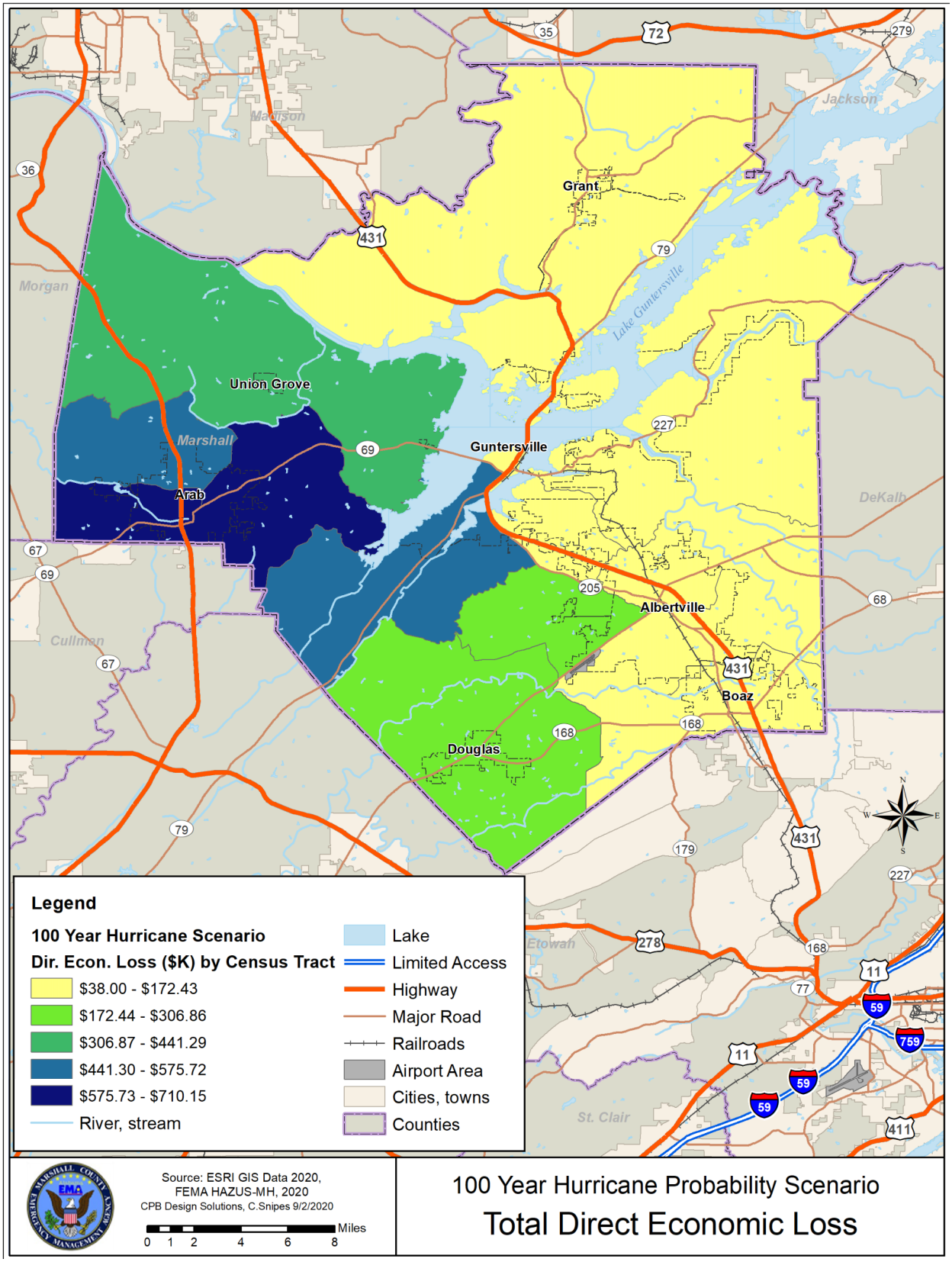
The building related losses are split into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the event. Business interruption losses also include temporary living expenses for those people displaced from their homes because of the hazard event.

Hazus-MH Hurricane Analysis

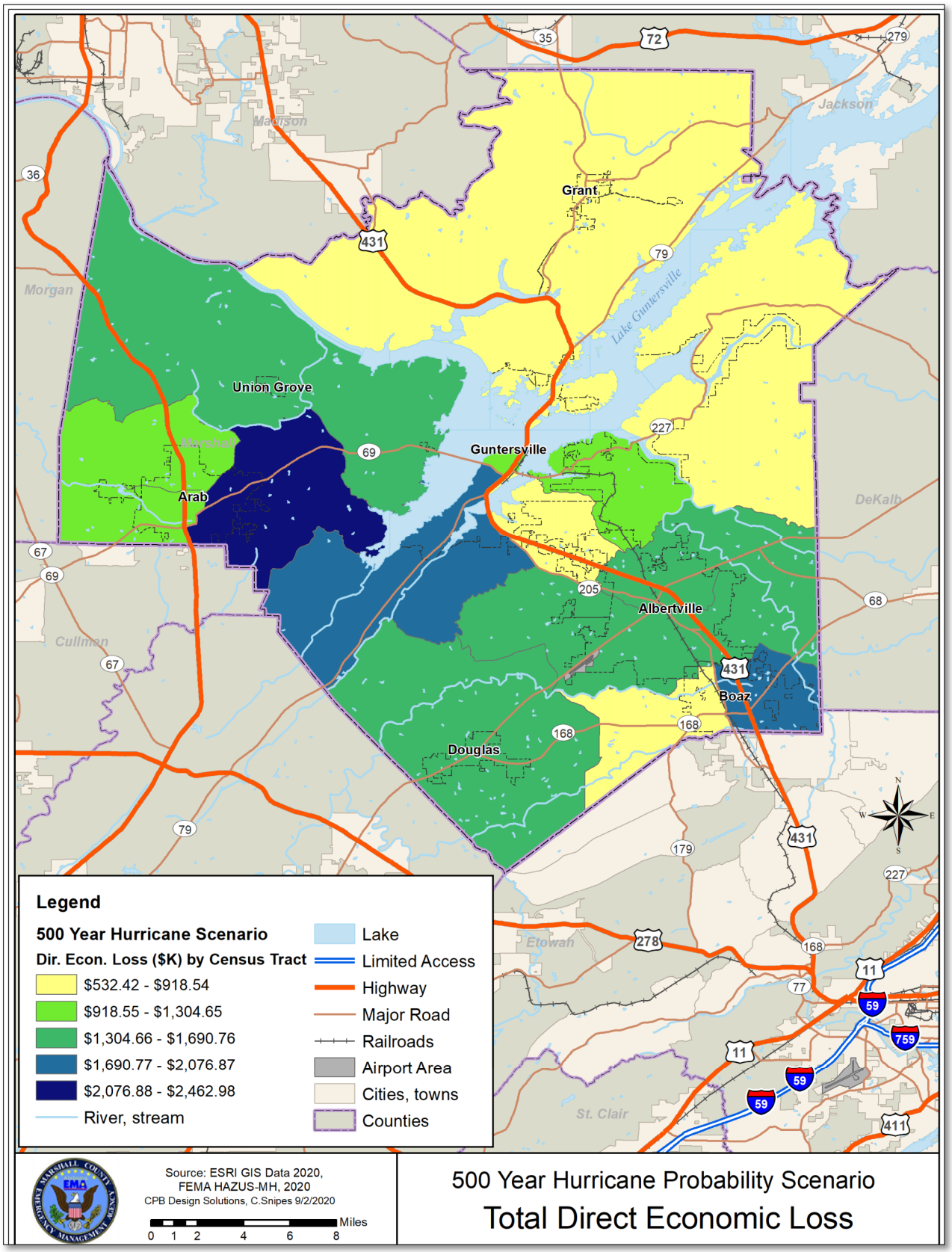
The Hazus specialist ran a 100-year and 500-year hurricane probability analysis for Marshall County, similar to the path of Hurricane Opal. All jurisdictions are at risk from hurricane winds; however, the analysis did not show any significant impact from hurricanes. While there has been significant damage from storms and tornadoes that develop from hurricanes, due to the distance from the hurricane event, Hazus reported very little loss for the county caused by the hurricane itself.

Maps 5-63 and 5-64 show the distribution of economic losses for a hurricane similar to the path Opal took in 1995 as a 100-year and 500-year event, respectively.

Map 5-63. 100 Year Hurricane Probability- Direct Economic Loss



Map 5-64. 500 Year Hurricane Probability- Direct Economic Loss



There was very little difference in the impact between a 100-year and 500-year hurricane event in terms of estimated damages and losses. Tables 5-49 and 5-50 show the building inventory exposed to the 100- and 500-year events categorized by occupancy and construction type.

Table 5-49. Building Exposure by Occupancy, 100- and 500-Year Hurricane

Occupancy	100-Year Probability		500-Year Probability	
	Structure Count	Percent of Total Building Inventory of Area	Structure Count	Percent of Total Building Inventory of Area
Agriculture	0.53	0	2.41	0
Commercial	8.02	0	31.63	0
Education	0.18	0	0.62	0
Government	0.25	0	0.84	0
Industrial	2.3	0	8.4	0
Religion	0.64	0	2.45	0
Residential	26.5	0	481.32	0.01
Total	38.42	0	527.67	0.01

Table 5-50. Building Exposure by Construction Type, 100- and 500-Year Hurricane

Construction Type	100-Year Probability		500-Year Probability	
	Structure Count	Percent of Total Building Inventory of Area	Structure Count	Percent of Total Building Inventory of Area
Concrete	2	0	5	0
Masonry	10	0	48	0
Manufactured Home	0	0	4	0
Steel	6	0	22	0
Wood	17	0	410	0.01
Total	35	0	489	0.01

As shown in Table 5-51, there would be no substantial damage to essential facilities by either hurricane scenario nor should there be any loss of use of any of the facilities.

Table 5-51. Essential Facility Damage by Count, 100- and 500-Year Hurricane

Essential Facility	100-Year Probability				500-Year Probability		
	Facility Count	Probability of at Least Moderate Damage	Probability of Complete Damage	Expected Loss of Use # of days	Probability of at Least Moderate Damage	Probability of Complete Damage	Expected Loss of Use # of days
EOCs	2	0.5%	0	0	0	0	0
Fire Stations	18	0.4%	0	0	0	0	0
Hospitals	2	0	0	0	0	0	0
Police Stations	10	0.4%	0	0	0	0	0
Schools	34	0.4%	0	0	0	0	0
Total	66	1.3%	0	0	0	0	0

According to the Hazus-MH 100-year probability analysis, total property damage losses for the structure in the study area were estimated to be around 4 million dollars. None of the estimated losses were related to business interruption of the region. The largest loss was sustained by the residential occupancies which made up over 98% of the total loss. For the 500-year probability analysis, the total property damage losses were estimated at 24 million dollars. Five percent of the estimated losses were related to business interruption of the region and residential occupancies made up over 97% of the total loss.

There were no households expected to be displaced and therefore no need for public shelters with either scenario.

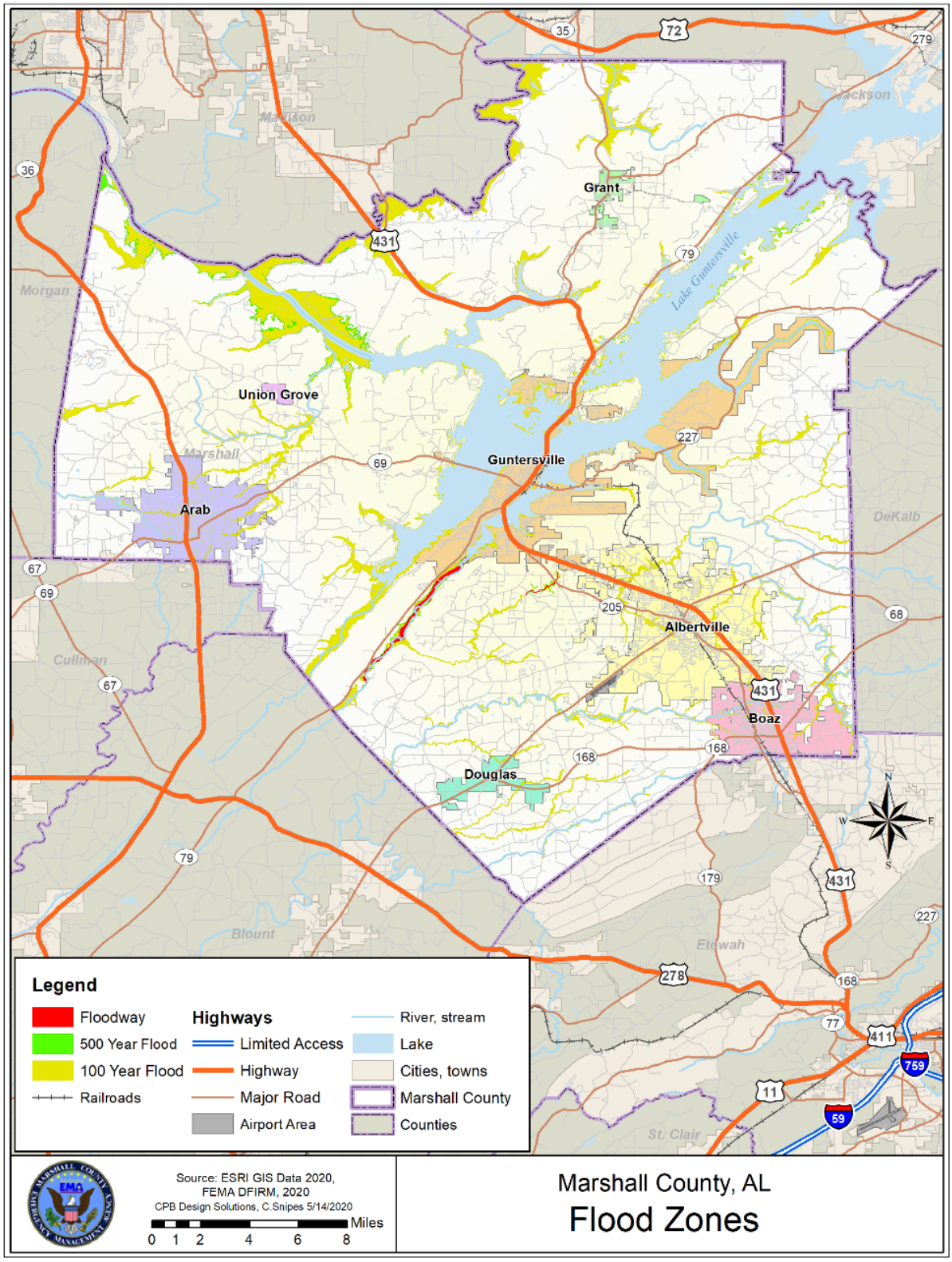
Hazus-MH 100-Year Flood Analysis

According to FEMA, a "100-year flood has a one percent chance of being equaled or exceeded during any given year. It can also be termed the "one percent" flood since this relates the event to an annual time period instead of a 100-year time period." A 100-year flood event scenario for Marshall County was run using Hazus-MH for this plan update. Not all jurisdictions are at equal risk from a 100-year flood event. Map 5-65 shows the 100- and 500-year flood zones for Marshall County.

The 100-year report generated by Hazus showed an estimate of 58 moderately damaged buildings which is over 19% of the buildings at risk of being affected by a 100-year flood in Marshall County. Also reported was that nine buildings would be totally destroyed.

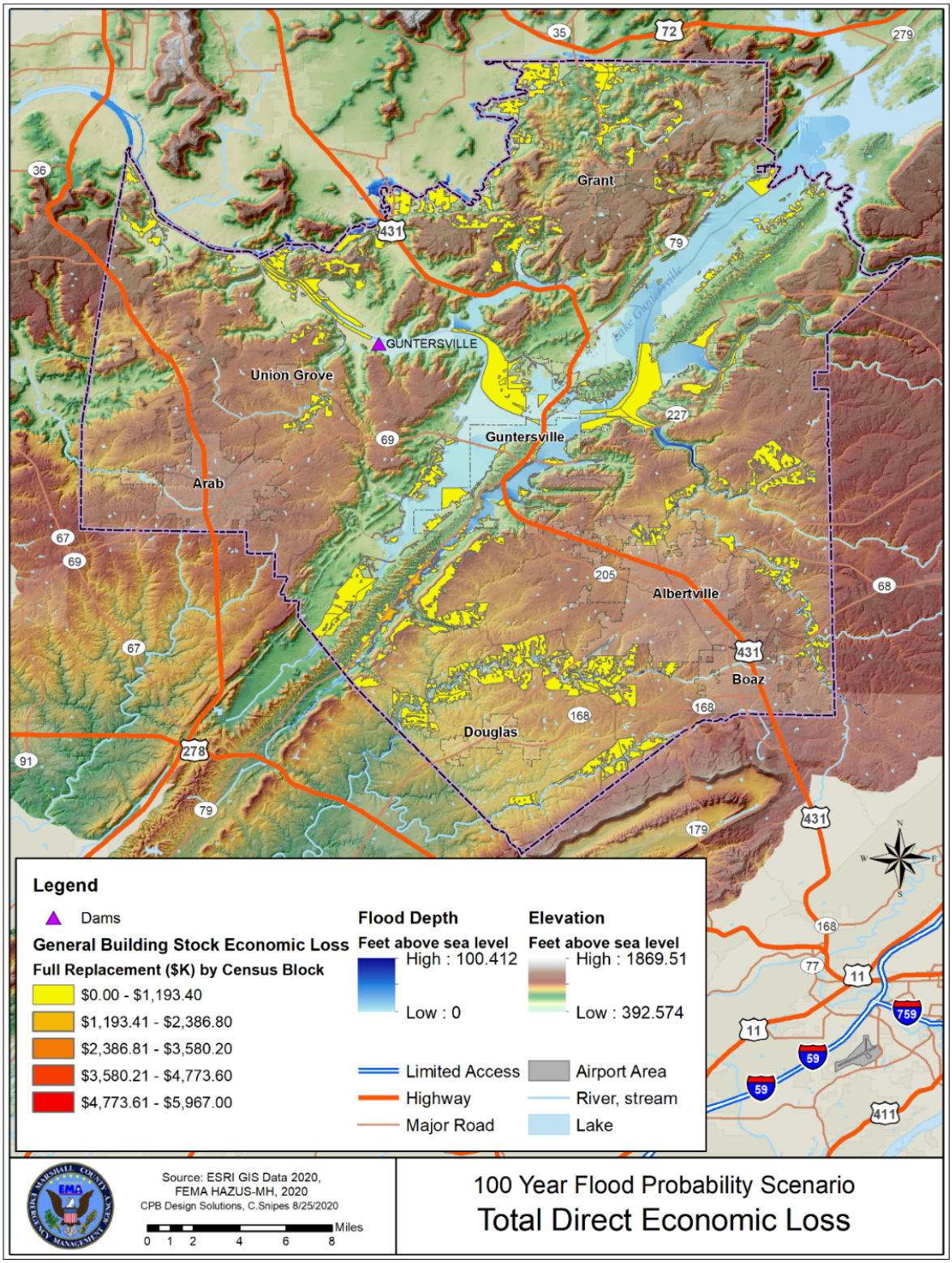
There were no damages reported for the essential facilities and hospitals would not be adversely affected. The total building related losses are estimated at $27.302 million and is broken out as follows: 33% in structural damage, 33% damage to contents, 1% inventory loss, 6% relocation loss, 9% capital related loss, 16% wage loss, and 2% rental income loss. Of the damage, residential accounted for 76% of the building related losses followed by commercial at 13% and industrial at 7%.

Map 5-65. Marshall County Flood Zones

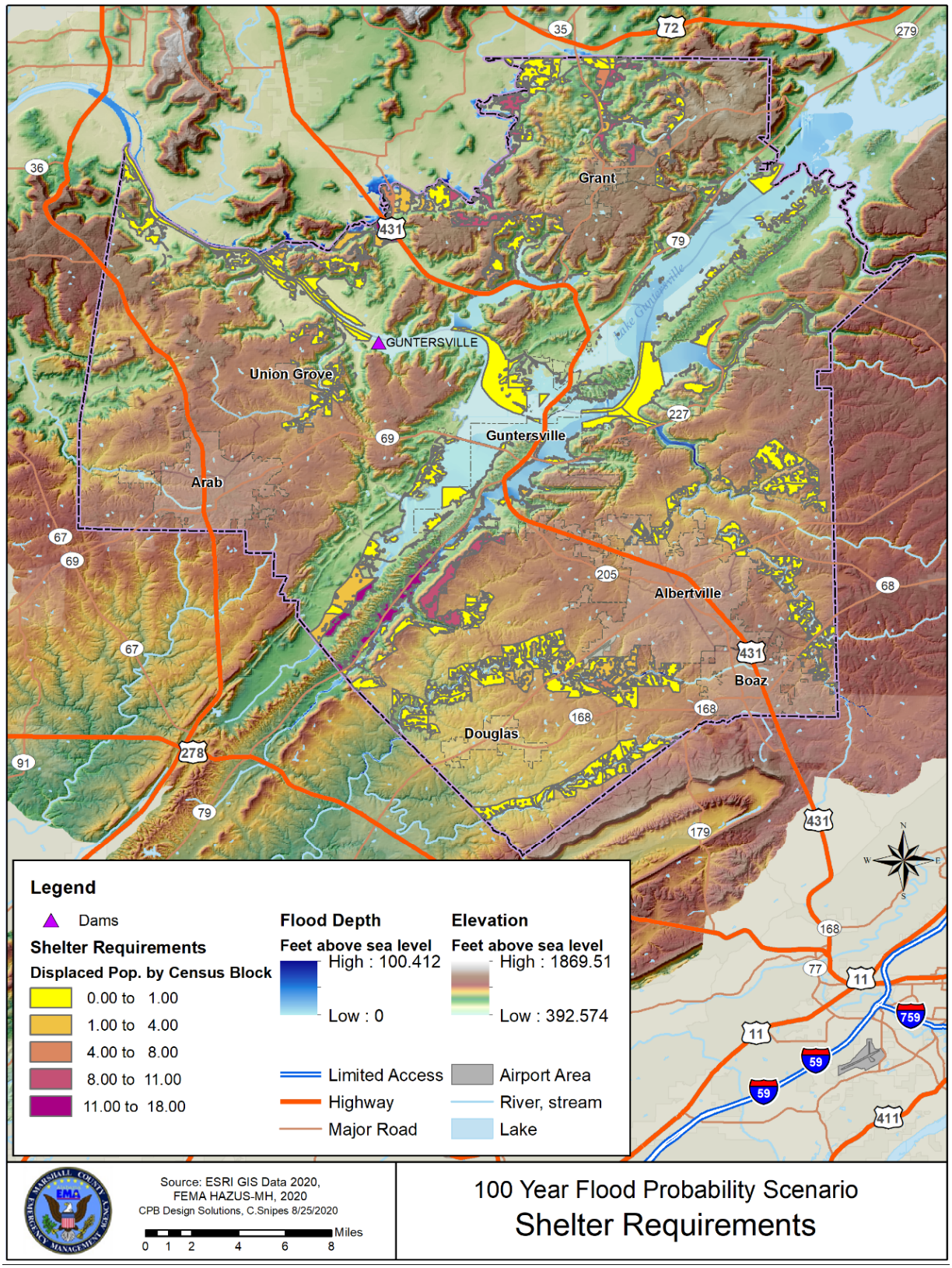


Map 5-66 shows the value of the buildings exposed to a 100-year flood event and Map 5-67 reveals shelter requirements if a 100-year flood event occurred in Marshall County.

Map 5-66. Value of Buildings Exposed to 100 Year Flood



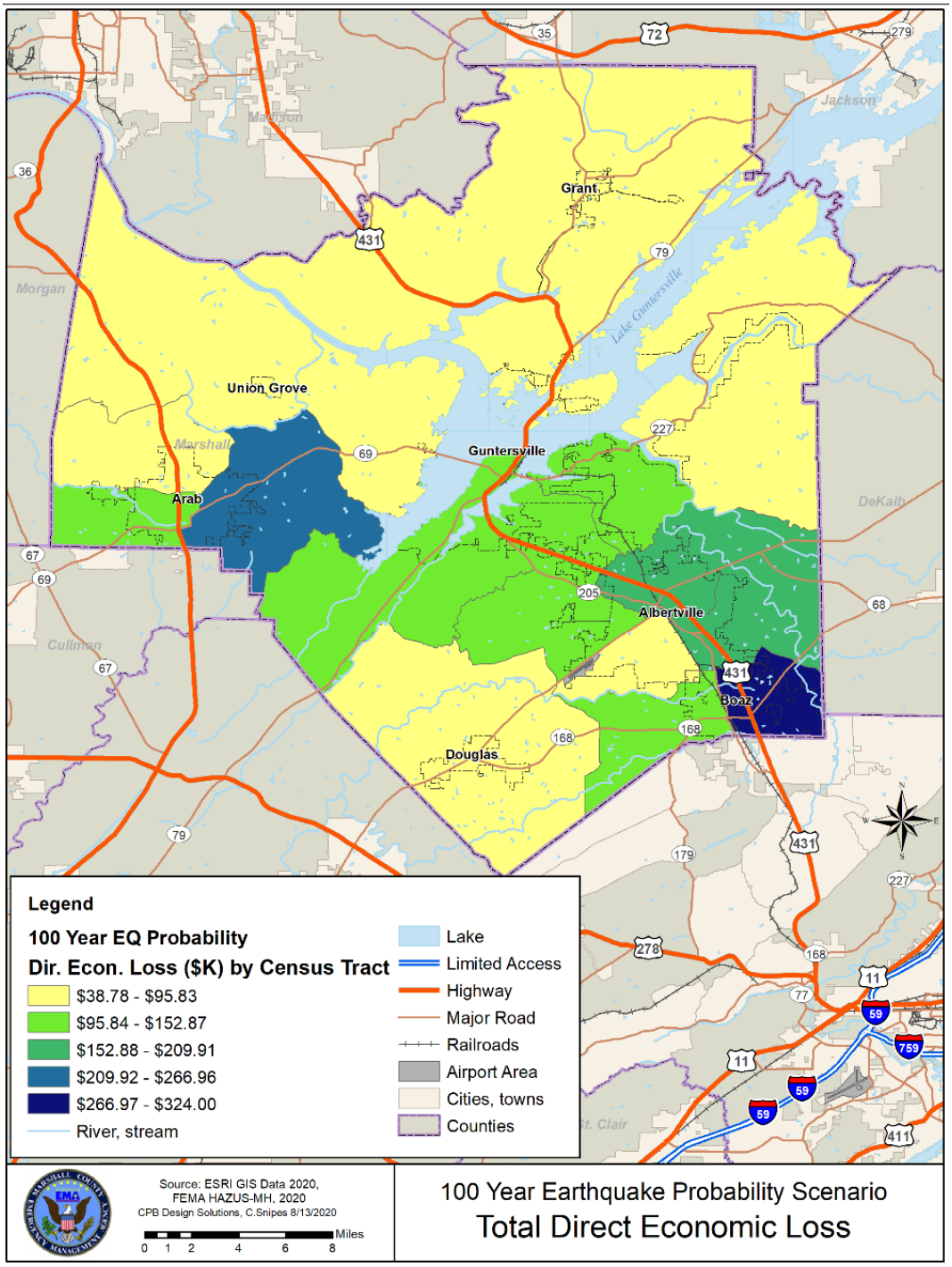
Map 5-67. Shelter Requirements for 100 Year Flood Event



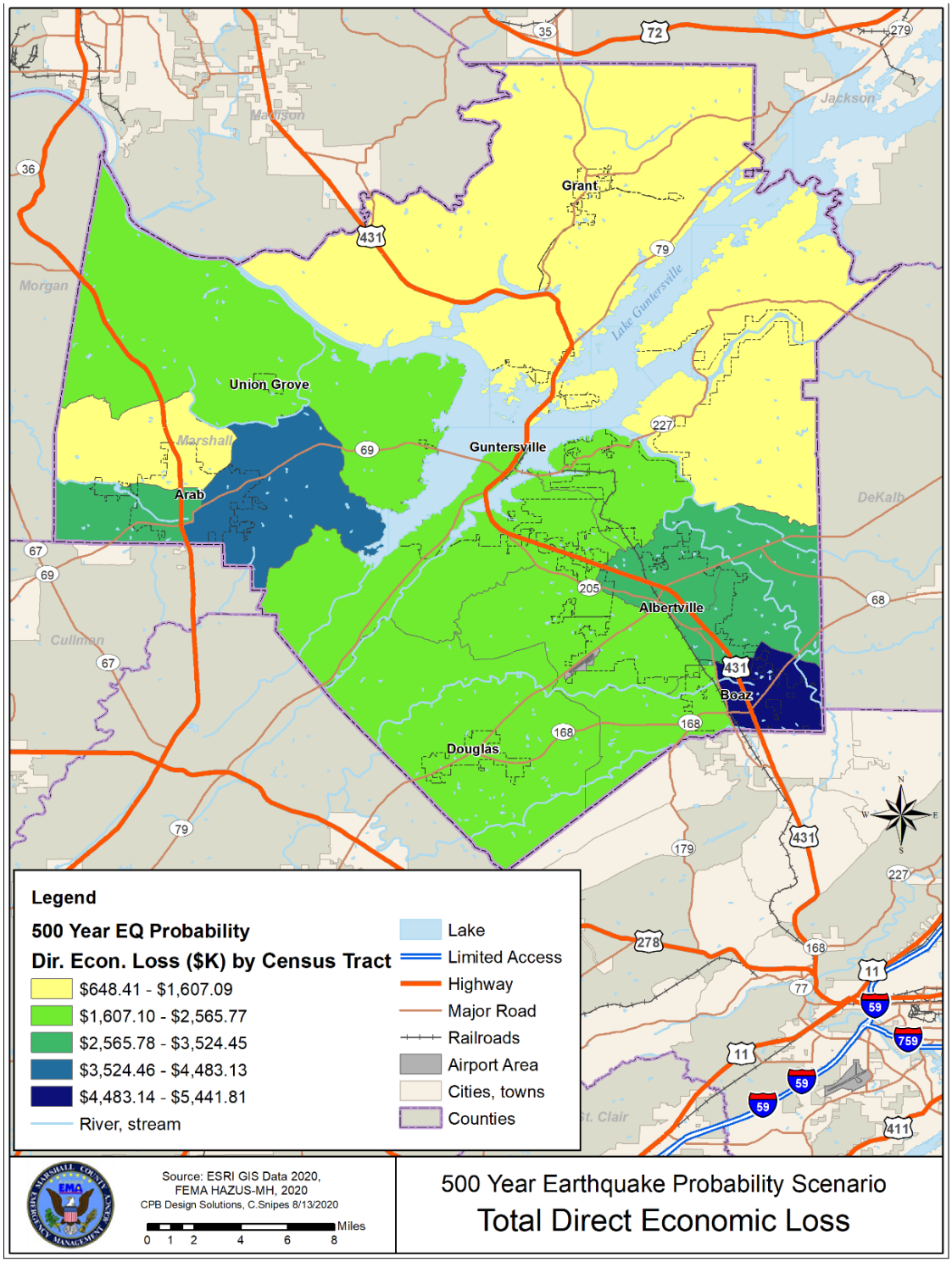
Hazus-MH Earthquake Analysis

A 100-year and 500-year earthquake probability analysis was run for Marshall County similar to the 1916 Irondale, Alabama earthquake event. All jurisdictions within Marshall County are at risk from earthquakes. Maps 5-68 and 5-69 show the distribution of economic losses related to a 100 year and 500-year event, respectively. The northern Section of the county is sparsely developed so the intensity of the quake did not alter the economic impact for that area.

Map 5-68. 100-Year Earthquake Economic Loss Impacts



Map 5-69. 500-Year Earthquake Economic Loss Impacts



As shown on the economic loss maps and in Tables 5-50, 5-51 and 5-52, a 100 or 500-year event for an earthquake centralized in Irondale, will result in minor damage. It is estimated that 57 buildings will be at least moderately damaged for the 100-year event which is less than 1%. For the 500-year scenario, 688 buildings are estimated to sustain at least moderate damage, 2%

of the buildings in the region. Residential buildings and wooden structures would suffer the most damage.

The essential facilities should not have severe damage; however, it is estimated that 97% of the beds would be available for use by patients already in the hospital and those injured by the earthquake immediately after a 100-year event, and 82% after a 500-year event. At the end of 30 days, 100% of hospital beds should be available from the 100-year event and 99% from the 500-year event.

The transportation systems within Marshall County should only suffer minor damage. Utility systems should also do well during the earthquake events sustaining only a few leaks and breaks in the pipelines.

The Hazus analysis estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. In the 100-year analysis, the model estimates 1 household to be displaced with no need for temporary shelter in a public shelter. The 500-year analysis estimated 16 households displaced with 12 people requiring temporary shelter.

The total economic loss estimated from the earthquakes are 2.54 million dollars and 48.93 million dollars for a 100-year and 500-year event, respectively. These values include building and lifeline related losses based on the region's available inventory.

Results from the 100- and 500-year probability scenarios are presented in Tables 5-52 through 5-54 and Charts 5-4 and 5-5.

Table 5-52. Building Exposure by Occupancy, 100- and 500-Year Earthquake Event

Occupancy	100-Year Probability		500-Year Probability	
	Structure Count	Percent of Total Building Inventory of Area	Structure Count	Percent of Total Building Inventory of Area
Agriculture	2	0	15	0
Commercial	31	0	234	0
Education	1	0	5	0
Government	1	0	6	0
Industrial	7	0	61	0
Other Residential	178	0	1173	0.03
Religion	3	0	21	0.00
Residential	83	0	1250	0.03
Total	305	0	2765	0.07

Table 5-53. Building Exposure by Construction Type to 100- and 500-Year Earthquake Event

Construction Type	100-Year Probability		500-Year Probability	
	Structure Count	Percent of Total Building Inventory of Area	Structure Count	Percent of Total Building Inventory of Area
Wood	54	0	1102	0.03
Steel	15	0	145	0.00
Concrete	2	0	22	0.00
Precast	2	0	14	0.00
Reinforced Masonry	4	0	29	0.00
Unreinforced Masonry	59	0	355	0.01
Manufactured Housing	169	0	1097	0.03
Total	305	0.01	2765	0.07

Table 5-54. Essential Facility Damage by Count, 100- and 500-Year Earthquake Event

Essential Facility	100-Year Probability				500-Year Probability		
	Facility Count	Probability of at Least Moderate Damage	Probability of Complete Damage	Expected Loss of Use # of days	Probability of at Least Moderate Damage	Probability of Complete Damage	Expected Loss of Use # of days
EOCs	2	0	0	0	0	0	0
Fire Stations	18	0	0	0	0	0	0
Hospitals	2	0	0	0	0	0	0
Police Stations	10	0	0	0	0	0	0
Schools	34	0	0	0	0	0	0
Total	66	0	0	0	0	0	0

Chart 5-5. Economic Loss, 100 Year Earthquake Scenario

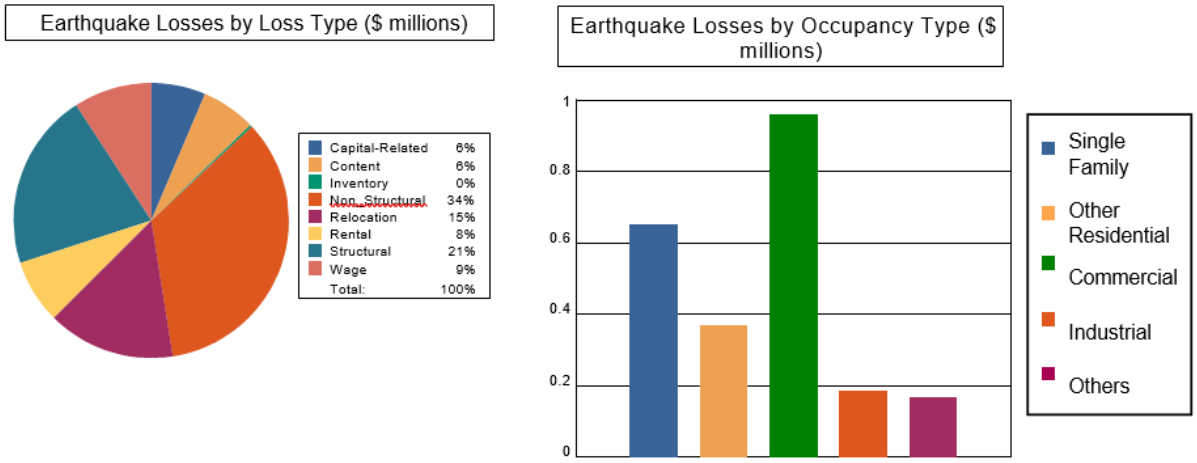
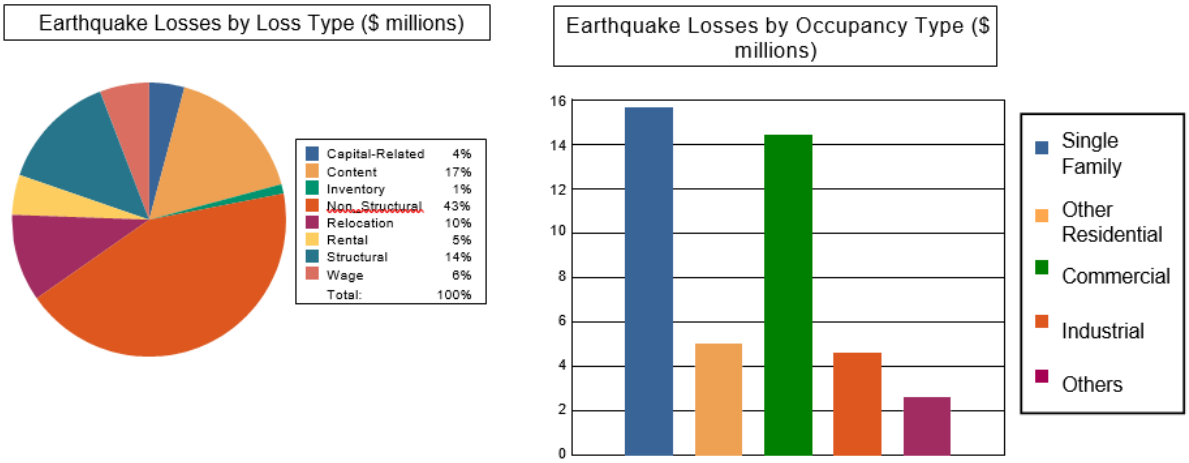


Chart 5-6. Economic Loss, 500 Year Earthquake Scenario



5.5.3 Loss Estimates Based on Historical Records

Severe Storms Loss Estimates

As reported in the severe storms hazard profile in Section 5.3.1, National Climatic Data Center (NCDC) records show frequent annual severe storm occurrences since 1960. The database shows 420 severe storm events for Marshall County, roughly ten per year. The database also shows over $106 million in property damages and 31 million in crop damages since 1960.

Tornado Loss Estimates

According to the NOAA National Climatic Data Center and National Weather Service (NWS) records (see Section 5.3.2 "Tornadoes Profile"), Marshall County has been the site of 31 tornadoes since 2009, averaging over 2.0 annually. These tornadoes caused 6 deaths, 90 injuries, and property damages of nearly $158 million.

Flood Loss Estimates

The National Climatic Data Center (NCDC) Storm Events Database shows frequent flooding since 1997 (Section 5.3.3). There have been 72 floods reported for Marshall County (3.3 per year) for the 1997-2019 period. Damages reported since 1997 are estimated at $1.9 million; however, most of this comes from the 2009 floods.

Winter Storms/Freeze Estimates

The National Climatic Data Center (NCDC) estimated that 72 winter weather events occurred in the ten-year period between 1993 and 2019. Damages amounted to $5.6 million, with most of the damages occurring during the Blizzard of 1993, which led to 4 deaths in Marshall County.

Loss Estimates for Remaining Hazards

Historical data is not available to estimate losses for the remaining hazards identified in this plan. In some cases, there have been no recorded events, such as dam/levee failures, and in other cases, no damages resulted from an event, as is the case for instances of wildfires, landslides, and sinkholes.

5.5.4 Recommended Risk Assessment Measures

The Mitigation Strategy of this Plan should include both short term and long term measures to improve the completeness and reliability of loss estimates. These measures should carry out the following general objectives:

- ✓ Critical Facilities Assessments. Assess critical facilities (hospitals, schools, fire and police stations, special needs housing, and others) to address building and site vulnerabilities to hazards, identify damage control and retrofit measures to reduce vulnerability to damage and disruption of operations during severe weather and disaster events.
- ✓ Geographic Information Systems (GIS). Maintain a comprehensive database of hazard locations, socio-economic data, infrastructure, and critical facilities inventories.
- ✓ Planning Studies. Conduct special plans and studies, as needed, to identify hazard risks and develop mitigation projects.

5.6 General Description of Land Uses and Development Trends

5.6.1 Impacts of Development Trends on Vulnerability

This section looks at how development impacts a community's vulnerability to a hazard. If development is not carefully assessed, it can aggravate existing conditions or even create new impacts from hazard events. By overseeing development, a jurisdiction can ensure that steps are taken to not worsen the impacts of hazards and possibly rectify certain negative impacts caused by hazards. Development can exacerbate vulnerability in several ways, including:

- Growth pushing development into areas prone to flooding, landslides, and other location-specific hazards.
- Impervious surfaces, such as roads and parking lots, can increase urban runoff and thereby exacerbate flooding unless proper measures such as drainage improvements or retention ponds are employed.
- Encroaching on the wildland-urban interface with new residential, commercial, and industrial development without care taken to reduce the risk for wildfires can increase the threat to the community for wildfires.
- Scarce water resources can be stretched in times of drought due to increased populations.

5.6.2 Past Trends

From 2000-2010 the growth rate for Marshall County was almost double the State of Alabama's; however, between 2010 and 2018 the growth rate for the county was about half of the state's growth rate. The three jurisdictions with the greatest growth rates in Marshall County over the last decade were the cities of Arab and Guntersville and the Town of Douglas. Table 5-55 depicts population growth trends from 2000-2018 per US Census Bureau statistics.

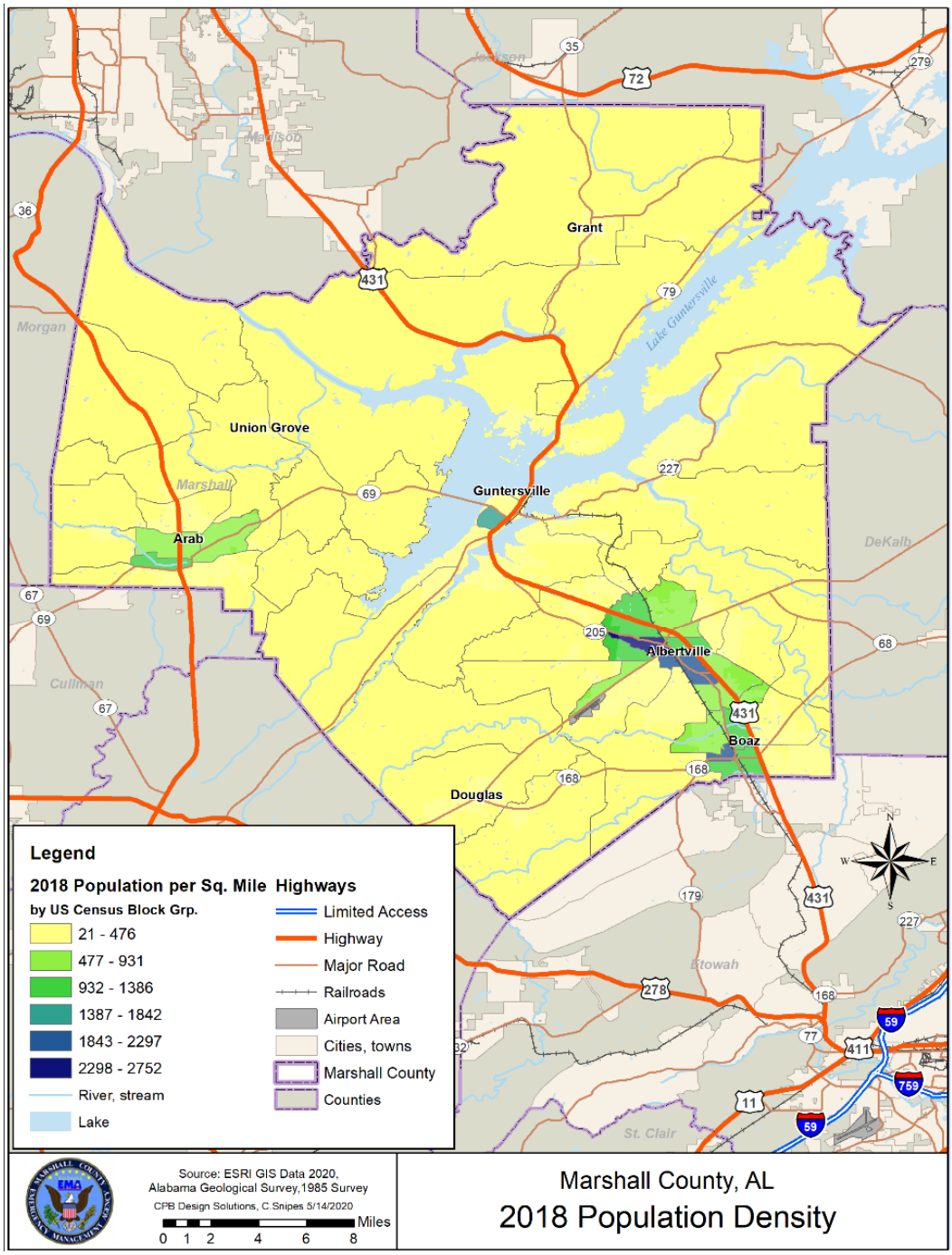
Table 5-55. Marshall County Historic Growth Trends

Jurisdiction	2000	2010	2000-2010 Growth	Percent Change 2000-2010	2018	2010-2018 Growth	Percent Change 2010-2018
Alabama	4,447,100	4,779,736	332,636	7.5%	4,887,681	107,945	2.3%
Marshall County	82,231	93,019	10,788	13.1%	94,109	1,090	1.2%
Albertville	17,247	21,160	3,913	22.7%	21,568	408	1.9%
Arab	7,174	8,050	876	12.2%	8,321	271	3.4%
Boaz	7,411	9,551	2,140	28.9%	9,656	105	1.1%
Douglas	530	744	214	40.4%	772	28	3.8%
Grant	665	896	231	34.7%	913	17	1.9%
Guntersville	7,395	8,197	802	10.8%	8,482	285	3.5%
Union Grove	94	77	-17	-18.1%	79	2	2.6%

The City of Albertville is the most populous city in Marshall County with 21,568 residents. The cities of Boaz, Guntersville and Arab are very close in population to one another with ninety-six hundred, eighty-four hundred and eighty-three hundred people, respectively. Union Grove's population increased between 2010 and 2018 after having declined between 2000 and 2010.

Map 5-70 shows population density (people per square mile) for Marshall County in 2018. The densest areas are located in Albertville and Boaz.

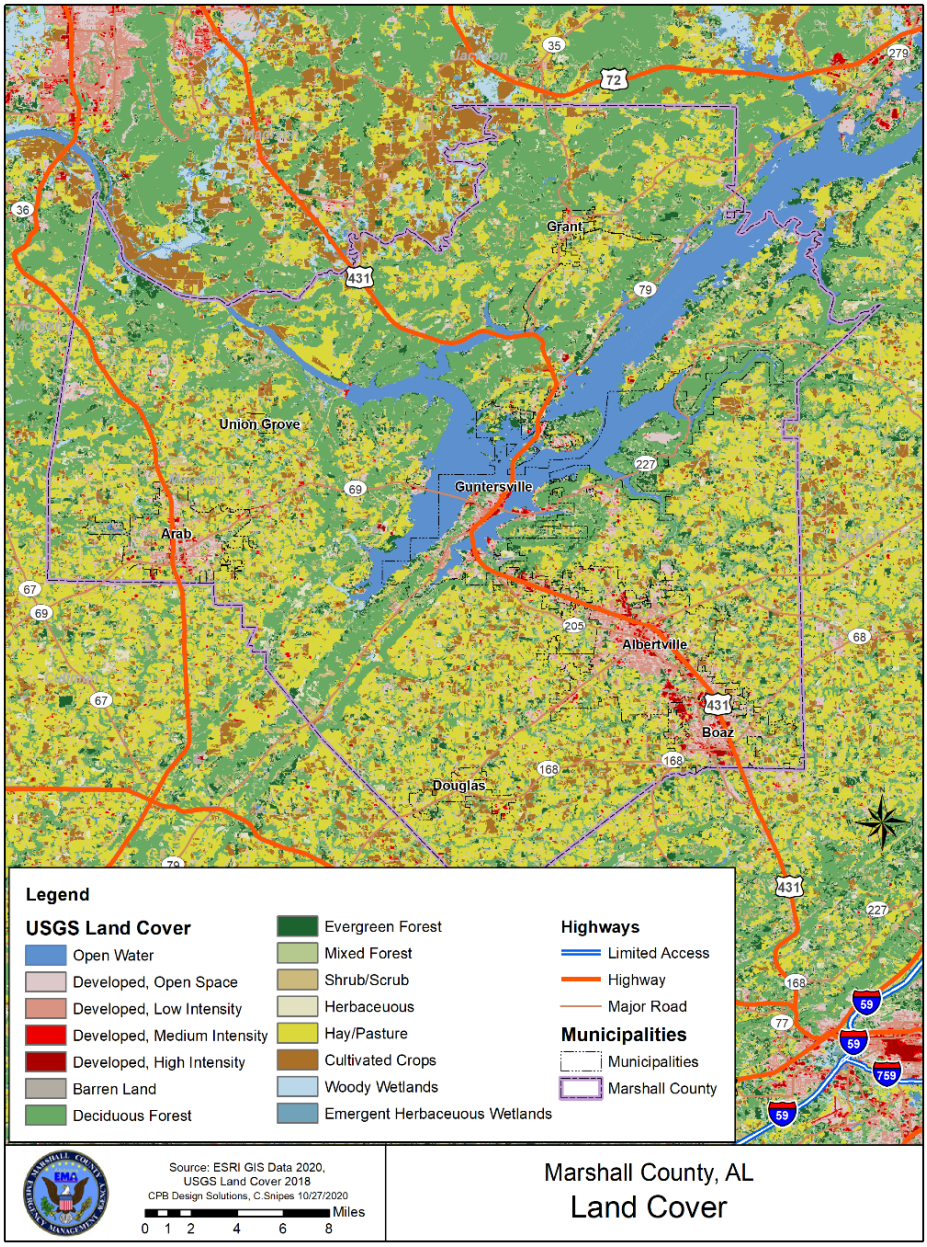
Map 5-70. Population Density in Marshall County



5.6.3 Land Cover and Land Use

Of Marshall County's 627 square miles, approximately 56 square miles is covered by Guntersville Reservoir. Approximately 40% of Marshall County's 362,918 acres are covered by forestland according to the Alabama Forestry Commission. Most of the land within Marshall County is covered by deciduous forest and pasture. A majority of the land use is agricultural with most of the population centered in the southeast Section of the county in Albertville and Boaz along Sand Mountain and Guntersville in the center of the county located along Guntersville Lake and the Tennessee River. Map 5-71 shows the land cover of Marshall County.

Map 5-71. Marshall County Land Cover



5.6.4 Future Trends

Table 5-56 presents projected growth in Marshall County between 2018 and 2040 according to projections compiled by the Center for Business and Economic Research at the University of Alabama. The projected percent increase in population for Marshall County is estimated to be 19%. Aside from the unincorporated Section of Marshall County (accounting for 45%), Albertville comprises most of the 2040 population growth at 25%. These projections are based on historical data and do not reflect current economic development efforts in Marshall County.

Table 5-56. Marshall County 2018 Population and 2040 Projections

Jurisdiction	Estimated 2018	Projected 2040	Projected Change 2018-2040	Percent Increase 2018-2040	Percent of Total 2040
Marshall County	94,109	110,021	15,912	16.91%	100.00%
Albertville	21,568	28,441	6,873	31.87%	25.9%
Arab	8,321	9,915	1,594	19.16%	9.0%
Boaz	9,656	11,586	1,930	19.99%	10.5%
Douglas	772	1,220	448	58.03%	1.1%
Grant	913	1,352	439	48.08%	1.2%
Guntersville	8,482	10,107	1,625	19.16%	9.2%
Union Grove	79	63	-16	-20.25%	0.1%
Unincorporated	44,318	47,337	3,019	6.81%	43.0%

Source: Derived from Alabama State Data Center and the U.S. Census

Economic development prospects

Marshall County's major employers are mainly in the poultry processing business. The following companies are listed as the county's top manufacturing employers:

- Pilgrim's Pride – poultry processing
- OK Foods – poultry processing
- Wayne Farms – poultry processing
- Tyson Foods Inc. – poultry processing
- TS Tech Alabama – automotive parts
- Colormasters – polyethylene plastic bag production
- AlaTrade Foods – poultry processing
- Mitchell Grocery – wholesale grocery
- Mueller Co. – fire hydrants
- Newman technology – automotive parts
- Progress Rail Service – railcar components

Marshall County's low cost of living combined with competitive market prices makes it an ideal location for businesses. The four major cities of Albertville, Boaz, Arab, and Guntersville create a region without all of the regional costs. The county is less than three hours away from larger markets, such as Huntsville, Birmingham, Chattanooga, and Atlanta. The additional growth in the Huntsville area, combined with such marketable traits, Marshall County should continue to grow at a reasonable rate for the foreseeable future both in the area of business and residential.

5.7 Repetitively-Damaged NFIP-Insured Structures

FEMA defines "repetitive loss property" as properties that have two or more losses of at least $1,000 and have been paid under the National Flood Insurance Program (NFIP) within any 10-year period since 1978. According to the State NFIP Coordinator, the unincorporated Section of Marshall County has one repetitively damaged single-family dwelling with three total repetitive loss claims totaling $131,678. This property is not in a flood hazard zone. Table 5-57 also describes the number of policies in force.

Table 5-57. NFIP Policies and Repetitive Loss Claims

Community Name	Total NFIP Policies	Repetitive Loss Structures	Total RL Claims	Total RL Losses	Total Insurance in Force
Albertville	51	0	0	$0	$9,043,100
Arab	24	0	0	$0	$6,041,900
Boaz	0	0	0	$0	$0
Douglas	0	0	0	$0	$0
Grant	0	0	0	$0	$0
Guntersville	17	0	0	$0	$4,198,100
Union Grove	0	0	0	$0	$0
Unincorporated	51	1	4	$171,678	$11,437,800
Totals	143	1	4	$171,678	$30,720,900

Source: State of Alabama Hazard Mitigation Plan, 2018

5.8 Summary of Hazards and Community Impacts

Table 5-58 summarizes each jurisdiction's vulnerability to the hazards identified through the risk assessment. Community impacts include the following descriptions and measurements:

Location. Location measures the geographic extent of the identified hazard in one of three ways:

1) *Community-wide* - the entire geographic area is affected;
2) *Partial* - a significant Section of the community is affected; or
3) *Minimal* - a negligible area is affected.

Probability. Probability measures the likelihood of the hazard occurring within the community, based on historical incidence. The scale for frequency runs as follows:

1) *Very high* - annually;
2) *High* - every two to three years;
3) *Moderate* - every three to ten years;
4) *Low* - every ten years; or
5) *Very low* - rare.

Extent. Extent measures the magnitude or severity of the hazard and its potential to cause casualties, business losses, and damage to structures. The scale utilized runs as follows:

1) *Devastating* - the potential for devastating casualties, business losses, and structure damage;
2) *Significant* - the potential for some casualties and significant, but less than devastating, business losses and structure damage;
3) *Moderate* – moderate potential for economic losses and structure damage; or
4) *Slight* – slight or minimal potential for economic losses and structure damage.

Exposure. Exposure measures the percentage of structures within the community, including buildings, critical facilities, and infrastructure lifelines, that are exposed to the hazard. The classifications are defined as follows:

1) *High* - includes more than approximately 25 percent of the structures;
2) *Medium* - includes 10 percent to 25 percent of the structures; or
3) *Low* - includes less than 10 percent of the structures.

Damage Potential. Damage potential measures the damage that can be expected should an event take place. The classifications are defined as follows:

1) *High* - a hazard could damage more than 5 percent of the structures in a community;
2) *Medium* - a hazard could damage between 1 and 5 percent of the structures in a community; or
3) *Low* - a hazard could damage less than 1 percent of the structures in a community

Table 5-58. Summary of Hazards and Community Impacts

Hazard	Jurisdiction	Community Impacts			Impacts on Vulnerable Community Buildings, Critical Facilities, and Infrastructure	
		Location	Probability	Extent	Level of Exposure	Level of Damage Potential
Tornadoes	All	Community-wide	High	Devastating	High	High
Severe Storms	All	Community-wide	Very High	Significant	High	Low
Hurricanes	All	Community-wide	Low	Moderate	High	Low
Winter Storms	All	Community-wide	Moderate	Moderate	High	Low
Droughts	All	Community-wide	High	Moderate	High	Low
Extreme Heat	All	Community-wide	Moderate	Moderate	High	Low
Earthquakes	All	Community-wide	Very Low	Devastating	High	Low
Pandemic/Disease	All	Community-wide	Low	Devastating	N/A	N/A
Human-Caused	All	Community-wide	Low	Devastating	High	High
Technological Hazards	All	Community-wide	High	Moderate	High	Low
Flash Floods	Albertville	Minimal	Moderate	Moderate	Low	Medium
	Arab	Minimal	Moderate	Moderate	Low	Medium
	Boaz	Partial	Moderate	Significant	Low	Medium
	Douglas	Minimal	Low	Slight	Low	Medium
	Grant	Minimal	Low	Slight	Low	Medium
	Guntersville	Partial	Moderate	Significant	Low	Medium
	Union Grove	Minimal	Low	Slight	Low	Medium
	Unincorporated Communities	Partial	Moderate	Significant	Low	Medium

Hazard	Jurisdiction	Community Impacts			Impacts on Vulnerable Community Buildings, Critical Facilities, and Infrastructure	
		Location	Probability	Extent	Level of Exposure	Level of Damage Potential
Riverine Floods	Albertville	Minimal	Moderate	Slight	Low	Low
	Arab	Minimal	Low	Slight	Low	Low
	Boaz	Minimal	Low	Slight	Low	Low
	Douglas	Minimal	Low	Slight	Low	Low
	Grant	Minimal	Low	Slight	Low	Low
	Guntersville	Partial	Low	Significant	Medium	High
	Union Grove	Minimal	Very Low	Slight	Low	Low
	Unincorporated Communities	Minimal	Moderate	Moderate	Low	Low
Wildfires	Albertville	Partial	Moderate	Moderate	Medium	Medium
	Arab	Partial	Moderate	Moderate	Medium	Medium
	Boaz	Partial	Moderate	Moderate	Medium	Medium
	Douglas	Partial	Moderate	Moderate	Medium	Medium
	Grant	Partial	Slight	Slight	Low	Low
	Guntersville	Partial	Moderate	Moderate	Medium	Medium
	Union Grove	Partial	Moderate	Moderate	Medium	Medium
	Unincorporated Communities	Partial	Moderate	Significant	High	Medium
Dam/Levee Failures	Albertville	Minimal	Very Low	Slight	Low	Low
	Arab	Minimal	Very Low	Slight	Low	Low
	Boaz	Minimal	Very Low	Slight	Low	High
	Douglas	Minimal	Very Low	Slight	Low	Low
	Grant	Minimal	Very Low	Slight	Low	High
	Guntersville	Partial	Very Low	Moderate	Low	High
	Union Grove	Minimal	Very Low	Slight	Low	Low
	Unincorporated Communities	Partial	Very Low	Significant	Medium	High

Hazard	Jurisdiction	Community Impacts			Impacts on Vulnerable Community Buildings, Critical Facilities, and Infrastructure	
		Location	Probability	Extent	Level of Exposure	Level of Damage Potential
Landslides	Albertville	Partial	Low	Slight	Low	High
	Arab	Partial	Low	Slight	Low	High
	Boaz	Partial	Low	Slight	Low	High
	Douglas	Partial	Low	Slight	Low	High
	Grant	Partial	Low	Slight	Low	High
	Guntersville	Partial	Low	Slight	Low	High
	Union Grove	Partial	Low	Slight	Low	High
	Unincorporated Communities	Partial	Low	Slight	Low	High
Sinkholes (Land Subsidence	Albertville	Minimal	Low	Not Severe	Low	High
	Arab	Minimal	Low	Not Severe	Low	High
	Boaz	Minimal	Low	Not Severe	Low	High
	Douglas	Minimal	Low	Not Severe	Low	High
	Grant	Community-Wide	Low	Not Severe	Medium	High
	Guntersville	Minimal	Low	Not Severe	Low	High
	Union Grove	Minimal	Low	Not Severe	Low	High
	Unincorporated Communities	Partial	Low	Not Severe	Medium	High

5.9 Risks that Vary Among the Jurisdictions

As can be seen throughout the Chapter Five, the risks posed by the hazards vary by jurisdiction. Some hazards impact the jurisdictions equally such as severe storms, tornadoes, hurricanes, winter storms, drought, extreme heat, earthquakes, pandemics, and infectious disease, human-caused, and technological. Risks from floods, dam failure, landslides, sink holes and wildfires vary by jurisdiction. Table 5-59 presents an overview of the common and unique risks within each jurisdiction and the unique characteristics of those risks.

The risk variations table uses the following terms, as defined here:

Variation of Risks: Measures whether a risk is common or unique, as follows:

1) Common risk - affects all areas equally; or
2) Unique risk - affects certain jurisdictions with varying probability and extent.

Location: Indicates whether a hazard's impact varies within the community, as follows:

1) Specific location- the hazard only threatens particular parts of the jurisdiction; or
2) Not unique - the hazard affects all parts of the jurisdiction.

Probability: If an event is location specific, the Probability measures the likelihood of the hazard occurring within the community, based on historical incidence. The scale for frequency runs as follows:

1) Very high - annually;
2) High - every two to three years;
3) Moderate - every three to ten years;
4) Low - every ten years; or
5) Very low - rare.

Extent: Extent measures the severity of the hazard and its potential to cause casualties, business losses, and damage to structures. The scale for extent runs as follows:

1) Severe - the potential for devastating casualties, business losses, and structure damage;
2) Somewhat Severe - the potential for some casualties and significant, but less than devastating, business losses and structure damage;
3) Moderately Severe – moderate potential for economic losses and structure damage; or
4) Not Severe – slight or minimal potential for economic losses and structure damage.

Table 5-59. Jurisdictional Risk Variations

Hazard	Jurisdiction	Variation of Risks	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
Tornadoes	Unincorporated Communities	Common Risks	Not Unique	Moderate	Severe
	Albertville	Common Risks	Not Unique	Moderate	Severe
	Arab	Common Risks	Not Unique	Moderate	Severe
	Boaz	Common Risks	Not Unique	Moderate	Severe
	Douglas	Common Risks	Not Unique	Moderate	Severe
	Grant	Common Risks	Not Unique	Moderate	Severe
	Guntersville	Common Risks	Not Unique	Moderate	Severe
	Union Grove	Common Risks	Not Unique	Moderate	Severe
Severe Storms	Unincorporated Communities	Common Risks	Not Unique	Moderate	Moderately Severe
	Albertville	Common Risks	Not Unique	Moderate	Moderately Severe
	Arab	Common Risks	Not Unique	Moderate	Moderately Severe
	Boaz	Common Risks	Not Unique	Moderate	Moderately Severe
	Douglas	Common Risks	Not Unique	Moderate	Moderately Severe
	Grant	Common Risks	Not Unique	Moderate	Moderately Severe
	Guntersville	Common Risks	Not Unique	Moderate	Moderately Severe
	Union Grove	Common Risks	Not Unique	Moderate	Moderately Severe

Hazard	Jurisdiction	Variation of Risks	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
Floods	Unincorporated Communities	Unique Risks	Specific Locations	Moderate	Moderately Severe
	Albertville	Unique Risks	Specific Locations	Moderate	Moderately Severe
	Arab	Unique Risks	Specific Locations	Low	Moderately Severe
	Boaz	Unique Risks	Specific Locations	Low	Moderately Severe
	Douglas	Unique Risks	Specific Locations	Low	Moderately Severe
	Grant	Unique Risks	Specific Locations	Low	Moderately Severe
	Guntersville	Unique Risks	Specific Locations	Low	Moderately Severe
	Union Grove	Unique Risks	Specific Locations	Very Low	Not Severe
Hurricanes	Unincorporated Communities	Common Risks	Not Unique	Very Low	Moderately Severe
	Albertville	Common Risks	Not Unique	Very Low	Moderately Severe
	Arab	Common Risks	Not Unique	Very Low	Moderately Severe
	Boaz	Common Risks	Not Unique	Very Low	Moderately Severe
	Douglas	Common Risks	Not Unique	Very Low	Moderately Severe
	Grant	Common Risks	Not Unique	Very Low	Moderately Severe
	Guntersville	Common Risks	Not Unique	Very Low	Moderately Severe
	Union Grove	Common Risks	Not Unique	Very Low	Moderately Severe

Hazard	Jurisdiction	Variation of Risks	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
Winter Storms/Freezes	Unincorporated Communities	Common Risks	Not Unique	Moderate	Not Severe
	Albertville	Common Risks	Not Unique	Moderate	Not Severe
	Arab	Common Risks	Not Unique	Moderate	Not Severe
	Boaz	Common Risks	Not Unique	Moderate	Not Severe
	Douglas	Common Risks	Not Unique	Moderate	Not Severe
	Grant	Common Risks	Not Unique	Moderate	Not Severe
	Guntersville	Common Risks	Not Unique	Moderate	Not Severe
	Union Grove	Common Risks	Not Unique	Moderate	Not Severe
Droughts/Heat Waves	Marshall County	Common Risks	Not Unique	Moderate	Moderately Severe
	Albertville	Common Risks	Not Unique	Moderate	Moderately Severe
	Arab	Common Risks	Not Unique	Moderate	Moderately Severe
	Boaz	Common Risks	Not Unique	Moderate	Moderately Severe
	Douglas	Common Risks	Not Unique	Moderate	Moderately Severe
	Grant	Common Risks	Not Unique	Moderate	Moderately Severe
	Guntersville	Common Risks	Not Unique	Moderate	Moderately Severe
	Union Grove	Common Risks	Not Unique	Moderate	Moderately Severe
	Unincorporated Communities	Common Risks	Not Unique	Moderate	Moderately Severe
Wildfires	Unincorporated Communities	Unique Risks	Specific Locations	Very High	Severe
	Albertville	Unique Risks	Specific Locations	Very Low	Moderately Severe
	Arab	Unique Risks	Specific Locations	Very Low	Moderately Severe
	Boaz	Unique Risks	Specific Locations	Very Low	Moderately Severe
	Douglas	Unique Risks	Specific Locations	Low	Moderately Severe

Hazard	Jurisdiction	Variation of Risks	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
	Grant	Unique Risks	Specific Locations	Low	Moderately Severe
	Guntersville	Unique Risks	Specific Locations	Low	Moderately Severe
	Union Grove	Unique Risks	Specific Locations	Low	Moderately Severe
Dam/Levee Failures	Marshall County	Unique Risks	Specific Locations	Low	Somewhat Severe
	Albertville	Unique Risks	Specific Locations	Low	Not Severe
	Arab	Unique Risks	Specific Locations	Low	Not Severe
	Boaz	Unique Risks	Specific Locations	Low	Not Severe
	Douglas	Unique Risks	Specific Locations	Low	Not Severe
	Grant	Unique Risks	Specific Locations	Low	Not Severe
	Guntersville	Unique Risks	Specific Locations	Low	Severe
	Union Grove	Unique Risks	Specific Locations	Low	Not Severe
	Unincorporated Communities	Unique Risks	Specific Locations	Low	Severe

Hazard	Jurisdiction	Variation of Risks	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
Landslides	Marshall County	Unique Risks	**Location**	**Probability**	**Extent**
	Albertville	Unique Risks	Specific Locations	Very Low	Not Severe
	Arab	Unique Risks	Specific Locations	Very Low	Not Severe
	Boaz	Unique Risks	Specific Locations	Very Low	Not Severe
	Douglas	Unique Risks	Specific Locations	Very Low	Not Severe
	Grant	Unique Risks	Specific Locations	Very Low	Not Severe
	Guntersville	Unique Risks	Specific Locations	Very Low	Not Severe
	Union Grove	Unique Risks	Specific Locations	Very Low	Not Severe
	Unincorporated Communities	Unique Risks	Specific Locations	Low	Not Severe
Earthquakes	Unincorporated Communities	Common Risks	Not Unique	Very Low	Not Severe
	Albertville	Common Risks	Not Unique	Very Low	Not Severe
	Arab	Common Risks	Not Unique	Very Low	Not Severe
	Boaz	Common Risks	Not Unique	Very Low	Not Severe
	Douglas	Common Risks	Not Unique	Very Low	Not Severe
	Grant	Common Risks	Not Unique	Very Low	Not Severe
	Guntersville	Common Risks	Not Unique	Very Low	Not Severe
	Union Grove	Common Risks	Not Unique	Very Low	Not Severe

Hazard	Jurisdiction	Variation of Risks	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
Sinkholes (Land Subsidence)	Unincorporated Communities	Unique Risks	Specific Locations	Very Low	Not Severe
	Albertville	Unique Risks	Specific Locations	Very Low	Not Severe
	Arab	Unique Risks	Specific Location	Very Low	Not Severe
	Boaz	Unique Risks	Specific Locations	Very Low	Not Severe
	Douglas	Unique Risks	Specific Locations	Very Low	Not Severe
	Grant	Unique Risks	Specific Locations	Very Low	Not Severe
	Guntersville	Unique Risks	Specific Locations	Very Low	Not Severe
	Union Grove	Unique Risks	Specific Locations	Very Low	Not Severe
Human-Caused	Unincorporated Communities	Common Risks	Not Unique	Very Low	Severe
	Albertville	Common Risks	Not Unique	Very Low	Severe
	Arab	Common Risks	Not Unique	Very Low	Severe
	Boaz	Common Risks	Not Unique	Very Low	Severe
	Douglas	Common Risks	Not Unique	Very Low	Severe
	Grant	Common Risks	Not Unique	Very Low	Severe
	Guntersville	Common Risks	Not Unique	Very Low	Severe
	Union Grove	Common Risks	Not Unique	Very Low	Severe

Hazard	Jurisdiction	Variation of Risks	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
Technological	Unincorporated Communities	Common Risks	Specific Locations	Moderate	Moderately Severe
	Albertville	Common Risks	Specific Locations	Moderate	Moderately Severe
	Arab	Common Risks	Specific Locations	Moderate	Moderately Severe
	Boaz	Common Risks	Specific Locations	Moderate	Moderately Severe
	Douglas	Common Risks	Specific Locations	Very Low	Moderately Severe
	Grant	Common Risks	Specific Locations	Very Low	Moderately Severe
	Guntersville	Common Risks	Specific Locations	Moderate	Moderately Severe
	Union Grove	Common Risks	Specific Locations	Very Low	Moderately Severe
Disease/Pandemic	Unincorporated Communities	Common Risks	Not Unique	Low	Severe
	Albertville	Common Risks	Not Unique	Low	Severe
	Arab	Common Risks	Not Unique	Low	Severe
	Boaz	Common Risks	Not Unique	Low	Severe
	Douglas	Common Risks	Not Unique	Low	Severe
	Grant	Common Risks	Not Unique	Low	Severe
	Guntersville	Common Risks	Not Unique	Low	Severe
	Union Grove	Common Risks	Not Unique	Low	Severe

Chapter 6 – Mitigation Strategy

6.1 Federal Requirements for the Mitigation Strategy
6.2 Summary of Plan Updates
6.3 A Vision for Disaster-Resistant Communities
6.4 Goals and Objectives for Hazard Mitigation
6.5 Mitigation Measure Identification, Prioritization, Implementation and Administration
6.6 2020 – 2025 Marshall County Multi-Jurisdiction Mitigation Action Program

6.1 Federal Requirements for the Mitigation Strategy

This chapter of the Plan addresses the Mitigation Strategy requirements of 44 CFR Section 201.6 (c) (3), as follows:

> "201.6 (c)(3) *A mitigation strategy* that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section shall include:
>
> (i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
>
> (ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.
>
> (iii) An action plan describing how the actions identified in paragraph (c) (3) (ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.
>
> (iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan."

6.2 Summary of Plan Updates

The updates to this chapter include a reorganization of the topics to follow the layout of the sections addressed in the federal requirements in section 6.1. Updates to the goals, objectives and mitigation measures reflect the findings of the Hazard Mitigation Planning Committee (HMPC) based on current conditions, the hazard risk assessment, revisions to the jurisdictions' community

capabilities, the implementation status of the 2014 Community Action Programs (CAP), the 2018 Alabama State Hazard Mitigation Plan, and participation in the National Flood Insurance Program (NFIP). New mitigation measures were added to the CAPs from the 2014 Hazard Mitigation Plan, and measures that were deemed unachievable due to a lack of legal authority or not being technically feasible were removed from the individual jurisdiction's CAPs. During the update process, a meeting was conducted with representatives of the school boards to discuss mitigation measures addressing the hazards affecting the school systems. The mitigation measures the school board representatives chose are reflected in the table at the end of this section and in the individual community action programs for each jurisdiction.

6.3 A Vision for Disaster-Resistant Communities

Marshall County and its communities developed a vision for resilient communities for their previous plans and this mission has remained unchanged.

The communities of Marshall County envision active resistance to the threats of nature to human life and property through publicly supported mitigation measures with proven results. Each community within the County embraces a long-term commitment to reduce the exposure and risks of natural and man-caused hazards within its jurisdiction by activating all available resources through cooperative intergovernmental and private sector initiatives, augmenting public knowledge and awareness, and enhancing local mitigation capabilities.

The communities are committed to realizing this vision through the following actions:

- Reducing or eliminating risks from natural, human-caused, and technological hazards.
- Reducing the vulnerability of existing, new, and future developments, including buildings and infrastructure.
- Minimizing exposure and vulnerability of people, buildings, critical facilities, and infrastructure to identified hazards.
- Increasing public awareness and support of hazard mitigation.
- Establishing interagency cooperation for conducting hazard mitigation activities.
- Strengthening communications and coordination among citizens and organizations.
- Integrating local hazard mitigation planning with the State of Alabama hazard mitigation planning, local comprehensive planning activities, and emergency operations planning.
- Protecting people and property and reducing losses and damages to buildings and infrastructure from natural, human-caused, and technical hazards.

These actions fulfill goals and objectives that make up the mitigation strategy which reduce or avoid long-term vulnerabilities to the identified hazards.

6.4 Goals and Objectives for Hazard Mitigation

FEMA's program categories for managing successful mitigation programs and ensuring resilient communities were used as a guide for the mitigation goals and objectives in the previous plans and were maintained in this update. Those categories are Prevention, Property Protection, Public Education and Awareness, Natural Resource Protection, and Structural Projects.

- ***Prevention.*** *Adopting and administering ordinances, regulations, and programs that manage the development of land and buildings to minimize risks of loss due to natural hazards.*
- ***Property Protection.*** *Protecting structures as well as their occupants and contents from the damaging effects of natural hazard occurrences, including retrofitting existing structures to increase their resistance to damage and to reduce exposure of occupants to harm; relocating vulnerable structures and occupants from hazard locations; and conversion of developed land to permanent open space through acquisition and demolition of existing structures.*
- ***Public Education and Awareness.*** *Educating and informing the public about the risks of hazards and the techniques available to reduce threats to life and property.*
- ***Natural Resources Protection.*** *Preserving and restoring the beneficial functions of the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.*
- ***Structural Projects.*** *Engineering structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of a hazard on a community.*

While the general goals remain unchanged, some of the objectives and measures to achieve the goal have been updated. Also, the goals have been broadened to include events rising from human-caused and technological hazards, and pandemic/infectious diseases. The changes to the objectives and mitigation measures take into consideration current conditions, the risk assessment, community capabilities, the status of the measures from the 2014 plan, and compatibility with the 2018 Alabama State Hazard Mitigation Plan. The mitigation actions chosen by the jurisdictions fulfill the goals of this plan update.

6.4.1 Current Conditions and Risk Assessment

In Chapter 5, "Risk Assessment", the hazards that were identified by the HMPC as posing a risk to the life and property of those residing in Marshall County were updated to include pandemics and infectious diseases. Since the 2014 plan update, especially in 2020, the concern over the risk of pandemics as well as human-caused and technological hazards has grown so they have been included in this plan update. The following hazards were identified through the risk assessment exercises and are addressed in the mitigation strategy:

- Tornadoes
- Severe Storms

- Floods
- Hurricanes
- Winter Storms and Extreme Cold
- Droughts
- Extreme Heat
- Wildfires
- Dam and Levee Failures
- Landslides
- Earthquakes
- Sinkholes
- Pandemics and Infectious Disease
- Human-Caused Hazards
- Technological Hazards

During the annual meeting of the North Alabama Health Care Coalition, a hazard vulnerability analysis was conducted. That analysis showed that the medical community in Marshall County ranked the following hazards as having the greater possibility of occurring and having an impact on the medical community listed from greatest concern to least for the top ten concerns:

- Emergent Disease
- Improvised Explosive Device
- Pandemic
- Mass Casualty Event – Hazmat Release
- Train Accident – Chlorine Release
- Cyber Attack
- Nuclear Facility Failure
- Tornado
- Water Supply Contamination
- Industrial Plant Explosion

The school systems identified extreme heat, winter storms and extreme cold, severe storms, and tornadoes as the hazards that concern them the most.

6.4.2 Community Capabilities

Jurisdictions within the State of Alabama have limited abilities to enact and enforce regulations and ordinances because Alabama is one of the few states that does not allow home rule by most of the jurisdictions. Marshall County is one such county without the permission for home rule. As such, Marshall County and its jurisdictions have restrictions on what measures they are allowed to undertake in relation to mitigation.

A community's capabilities determine which mitigation objectives they can realistically expect to achieve; therefore, a capabilities assessment was conducted to determine the community's abilities in regard to planning and regulation, staffing and administrative resources, technical resources, financial resources, and education and awareness programs. Due to the size of some of the jurisdictions, some services are performed by the county departments such as the EMA and outside sources such as consulting engineers and planning commissions. Limited GIS support is offered through the revenue department and the EMA.

The school systems in Alabama participate in a school safety platform called nSide which is a partnership between the Alabama State Department of Education, the Alabama Law Enforcement Agency, and nSide which provides protection to all participating schools. This partnership helps strengthen the security measures already in place and offers new technology and training for additional security. They also assist with the schools with the development of Emergency Operations Plans which all public schools in Marshall County have.

This capabilities assessment identified any gaps or weaknesses that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. This report also helps evaluate whether a proposed mitigation action is deemed practical when considering the local participating jurisdiction's ability to implement the action. A summary of each jurisdictions' capabilities follows with a more extensive analysis of these capabilities in Appendix B "Community Mitigation Capabilities".

Table 6-1. Planning and Regulatory Tools

Planning and Regulatory	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Unincorporated Marshall County	Union Grove
Adopted 2014 Hazard Mitigation Plan	Y	Y	Y	Y	Y	Y	Y	N
Comprehensive/Master Plan	Y	Y	Y	N	N	Y	N	N
Capital Improvements Plan	Y	Y	Y	N	Y	N	Y	N
Economic Development Plan	N	Y	N	N	Y	N	Y	N
Local Emergency Operations Plan	Y	Y	Y	Y	Y	N	Y	N
Continuity of Operations Plan	N	N	N	N	Y	N	N	N
Transportation Plan	N	N	Y	N	N	N	N	N
Stormwater Management Plan	N	Y	N	N	Y	Y	N	N
Community Wildfire Protection Plan	N	N		N	N	N	N	N
Building Code	Y	Y	Y	N	N	Y	N	N

Planning and Regulatory	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Unincorporated Marshall County	Union Grove
Open Burn Regulations	Y	Y	Y	Y	Y	Y	Y	Y
Zoning Ordinance	Y	Y	Y	N	Y	Y	N	N
Subdivision regulations	Y	Y	Y	N	Y	Y	Y	N
Floodplain Ordinance	N	Y	Y	N	N	Y	Y	N
Natural hazard specific ordinance	N	N	N	N	N	N	N	N
Flood Insurance Rate Maps	N	Y	Y	Y	N	N	Y	N
Acquisition of land for open space and public recreation uses	N	Y	Y	N	Y	N	N	N

Table 6-2. Staffing and Administrative Resources

Staffing and Administrative	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Unincorporated Marshall County	Union Grove
Planning Commission	Y	Y	Y	N	N	Y	N	N
Mitigation Planning Committee	N	Y	N	N	N	N	Y	N
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	Y	Y	Y	N	N	N	N
Mutual aid agreements	Y	Y	Y	Y	Y	N	Y	Y
Chief Building Official	Y	Y	Y	N	N	Y	N	N
Floodplain Administrator	Y	Y	Y	N	N	N	Y	N
Emergency Manager	N	Y	N	N	N	N	Y	N
Community Planner	N	Y	N	N	N	N	N	N
Civil Engineer	Y	Y	Y	N	N	N	Y	N
GIS Coordinator	N	N	Y	N	N	N	Y	N

Table 6-3. Technical Resources

Technical	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Unincorporated Marshall County	Union Grove
Warning Systems/Services	N	Y	Y	Y	Y	Y	Y	Y
Hazard data and information	N	Y	Y	Y	N	Y	Y	N
Grant writing	Y	Y	Y	Y	Y	Y	Y	N
Hazus analysis	N	N	N	N	N	N	N	N

Table 6-4. Financial Resources

Financial	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Unincorporated Marshall County	Union Grove
Capital improvements project funding	Y	Y	Y	Y	Y	Y	Y	N
Authority to levy taxes for specific purposes	Y	Y	Y	N	Y	Y	Y	N
Fees for water, sewer, gas, or electric services	N	N	N	N	N	Y	N	Y
Impact fees for new development	N	Y	N	N	N	Y	Y	N
Storm water utility fee	N	N	N	N	N	Y	N	N
Incur debt through general obligation bonds and/or special tax bonds	Y	Y	Y	N	Y	Y	Y	N
Incur debt through private activities	Y		Y	N	Y	Y	Y	N
Community Development Block Grant	Y	Y	Y	Y	N	Y	Y	N
Other federal funding programs	Y	Y	Y	Y	Y	Y	Y	Y
State funding programs	Y	Y	Y	Y	Y	Y	Y	N

Table 6-5. Education and Awareness Programs

Education and Awareness	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Unincorporated Marshall County	Union Grove
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access, and functional needs populations, etc.	N	Y	N	Y	N	Y	Y	Y
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	N		Y	Y	N	Y	Y	Y
Natural disaster or safety related school programs	Y	Y	Y	Y	N	Y	Y	N
StormReady certification	Through EMA							
Firewise Communities certification	N	N	N	Y			N	N
Public-private partnership initiatives addressing disaster-related issues	N	Y	N	Y	N		Y	N
Library	Y	Y	Y	N	Y	Y	Y	N

6.4.3 2014 Community Action Program Implementation Status

In order to provide realistic mitigation measures for this update, the committee members gathered information from officials about the status of objectives from the 2014 plan through an implementation status questionnaire. The questionnaire assessed the status of each mitigation measure for the jurisdiction from the community action programs of 2014. The committee member met with officials responsible for the measure and inquired whether each objective was reached successfully. Measures that were confirmed to be completed within the jurisdiction were recorded as "Completed". Incomplete efforts toward accomplishing an objective were marked as "No" in the "Completed" column with the respondent being required to notate a reason for the failure to complete the objective. One option for an explanation of incomplete effort was that the effort was "On-Going" for objectives that the jurisdiction was still working toward. The respondents stated other reasons for non-completion, which included: "Lack of Funding", "No Legal Authority", "Administrative Shortage", "Lack of Political Support", and "Not Technically Feasible". (See Appendix C "2014 Plan Implementation Status" for more information.)

Some mitigation actions for certain jurisdictions from the 2014 plan that were not completed due to "No Legal Authority" or "Not Technically Feasible" were removed from the new mitigation action items for the respective jurisdictions. For those communities that wanted to maintain a measure but did not have the legal authority or for whom the measure was not technically feasible, wording in the measure was altered so that the measure would be achievable. For example, in the measure *Require the construction of safe rooms within new public buildings, such as new schools, libraries, community centers, and other public buildings by amending applicable ordinances and regulations,* the

word "require" was changed to "encourage". If a community cited an administrative shortage, lack of funding or lack of political support as the reason for not completing the measure, some of these measures were retained for this update because it is possible that some of those factors will change over the next 5 years.

6.4.4 Compatibility with the 2018 Alabama State Plan Goals

The vision, goals, and objectives for Marshall County and its jurisdictions are reflective of the 2018 goals from the Alabama State Hazard Mitigation Plan. The State updated their goals in the 2018 plan as follows:

Goal 1: Enhance the comprehensive statewide hazard mitigation system;
Goal 2: Reduce the State of Alabama's vulnerability and increase resilience to hazards to protect people, property, and natural resources;
Goal 3: Foster public awareness and understanding of their hazard risk and of mitigation opportunities; and
Goal 4: Expand and promote coordination and communication with other government agencies, local governments, other relevant organizations.

Marshall County and its jurisdictions are integral in the state's hazard mitigation system. Their efforts in addressing the hazards that impact their area help the State of Alabama achieve its mitigation goals. Marshall County's primary actions align with the State goals, as follows: (a) to reduce the vulnerability of existing, new, and future development of buildings and infrastructure; (b) to minimize exposure and vulnerability of people, buildings, critical facilities, and infrastructure to identified hazards; (c) to increase public awareness and support of hazard mitigation; and (d) to establish interagency cooperation for conducting hazard mitigation activities. There is a direct correlation between the success of Marshall County's efforts toward effective hazard mitigation and the success of the State's efforts.

6.4.5 Participation and Compliance with the National Flood Insurance Program

Marshall County and its jurisdictions, with the exception of the Town of Union Grove, have been mapped and the floodplain identified. As of 2020, the Town of Douglas had not adopted a local floodplain ordinance and has been removed from the National Flood Insurance Program.

The jurisdictions of Marshall County, Albertville, Arab, Boaz, Grant, and Guntersville all are members in good standing with the National Flood Insurance Program (NFIP). The maps have recently been updated for those jurisdictions according to the Preliminary FIRM letters dated September 7, 2020. All current NFIP communities in Marshall County have effectively enforced and maintained currency of their floodplain ordinances since their original entry into the program. Local floodplain administrators provide technical assistance to applicants and remain apprised of changes in floodplain management requirements through the State NFIP Coordinator. All communities, except for the Town

of Union Grove (which has no areas of special flood hazards mapped by FEMA) and Douglas, have developed five-year action programs to improve local floodplain management programs (see specific action items for each community in Section 6.7, Goal 1 Prevention, Objective 1.5 "Floodplain Management Program.") The following actions demonstrate a commitment by the communities to effectively implement the NFIP:

- Longstanding records of continuous and effective enforcement of floodplain management ordinance requirements;
- Continuing education of local floodplain administrators;
- Community outreach to inform builders and property owners of floodplain management ordinance permitting requirements;
- Continuing updates of local floodplain ordinances for compliance with the most current NFIP standards;
- Maintaining the latest FIRM data in the County's GIS database for all communities;
- Ongoing relations by each community with the State NFIP Coordinator;
- Monitoring flooding events and damages in conjunction with the Marshall County EMA;
- Encouragement to participate in the Community Rating System (CRS) program, through this hazard mitigation planning process and the HMPC; and
- Maintaining NFIP publications on-hand by the Marshall County EMA as technical support resources to local floodplain administrators and as public education information for the general public.

The following Table 6-2 provides information on the NFIP participation status of Marshall County jurisdictions:

Table 6-6. NFIP Community Status, Marshall County Jurisdictions

Community ID	Jurisdiction	Current Effective Map Date	Status
010275	Marshall County	3/21/2019	Participating
010366	Albertville	03/21/2019(M)	Participating
010345	Arab	09/16/2011(M)	Participating
010276	Boaz	3/21/2019	Participating
010311	Guntersville	09/16/2011	Participating
010459	Douglas	03/21/2019	Not Participating
010282	Grant	09/16/2011	Participating
-------	Union Grove	Not Mapped	Not Mapped

(M)=No Elevations Determined - All Zone A, C and X

Source: NFIP Community Status Book, 09/03/2020

6.5 Mitigation Measure Identification, Prioritization, Implementation and Administration

The data gathered through the risk assessment, implementation status of the 2014 Community Action Programs, and the capabilities assessment was used to update the objectives and measures from the 2014 plan. During the hazard risk assessment phase of the planning process, the HMPC members were encouraged to record any concerns they had about the hazards being discussed. In addition, they were presented with opportunities to share ideas about existing and possible mitigation efforts in relation to the hazards listed. A thorough evaluation of the concerns and mitigation ideas was conducted and many of these contributions were included in the plan update.

New measures were sorted according to FEMA's program categories. Those categories are Prevention, Property Protection, Education and Awareness, Natural Resource Protection, and Structural Projects. The category Public Education and Outreach was changed to Education and Awareness because new measures apply to the education of officials and staff, in addition to the public. Several steps were taken to develop the final Community Action Programs including identifying appropriate mitigation measures for each jurisdiction, assigning a priority to selected measures, establishing a general completion schedule, assigning administrative responsibility for carrying out the measures, estimating costs, where possible, and identifying potential funding sources, including potential eligibility for FEMA Hazard Mitigation Assistance Programs.

6.5.1 Mitigation Measure Identification and Evaluation

The first step in identifying mitigation measures for the community action program was to provide a comprehensive list of mitigation measures, including the new mitigation measures, to the jurisdictions for review. The comprehensive list is included in Appendix F. The jurisdictions were instructed to review the list and choose the mitigation actions they wanted considered for the next five years. They were asked to cross out any measure they did not want included in the plan update, including those that were not completed from the 2014 plan due to not being technically feasible or because of a lack of legal authority for implementation. Once the jurisdictions provided the base list to the plan coordinator, a table of the measures for each jurisdiction was created for the next step.

A table with the mitigation measures for each jurisdiction was provided to the jurisdictions for review and verification. For completion of the review, the jurisdictions were instructed to consider measures using the evaluation method known as STAPLEE when verifying and prioritizing the measures for their communities. STAPLEE examines social, technical, administrative, political, legal, environmental, and economic considerations. Not all of the mitigation measures initially considered were included in the final Community Action Programs. (Volume II "Community Action Programs"). The STAPLEE evaluation eliminated many of the measures due to such things as the lack of capabilities and lack of legal authority. If a jurisdiction did not have a capability at the time of the plan update but had reported efforts toward obtaining the capability over the next five years, that mitigation measure was selected for their action program.

The STAPLEE method addressed the following areas of concern and responded to many of the questions presented here:

1. *Social Considerations.*
   - *Environmental justice: Will the proposed measure be socially equitable to minority, disadvantaged, and special needs populations, such as the elderly and handicapped?*
   - *Neighborhood impact: Will the measure disrupt established neighborhoods or improve quality of life for affected neighborhoods?*
   - *Community support: Is the measure consistent with community values? Will the affected community support the measure?*
   - *Impact on social and cultural resource: Does the measure adversely affect valued local resources or enhance those resources?*

2. *Technical Considerations.*
   - *Technical feasibility: Is the proposal technically possible? Are there technical issues that remain? Does the measure effectively solve the problem or create new problems? Are there secondary impacts that might be considered? Have professional experts been consulted?*

3. *Administrative Considerations.*
   - *Staffing: Does the jurisdiction have adequate staff resources and expertise to implement the measure? Will additional staff, training, or consultants be necessary? Can local funds support staffing demands? Will the measure overburden existing staff load?*
   - *Maintenance: Does the jurisdiction have the capabilities to maintain the proposed project once it is completed? Are staff, funds, and facilities available for long-term project maintenance?*
   - *Timing: Can the measure be implemented in a timely manner? Are the timeframes for implementation reasonable?*

4. *Political Considerations.*
   - *Political support: Does the local governing body support the proposed measure? Does the public support the measure? Do stakeholders support the measure? What advocates might facilitate implementation of the proposal?*

5. *Legal Considerations.*
   - *Legal authority: Does the jurisdiction have the legal authority to implement the measure? What are the legal consequences of taking action to implement the measure as opposed to an alternative action or taking no action? Will new legislation be required?*

6. *Environmental Considerations.*
   - *National Environmental Policy Act (NEPA): Will the measure be consistent with*

Federal NEPA criteria? How will the measure affect environmental resources, such as land, water, air, wildlife, vegetation, historic properties, archaeological sites, etc.? Can potentially adverse impacts be sufficiently mitigated through reasonable methods?

- *State and local environmental regulations: Will the measure follow State and local environmental laws, such as floodplain management regulations, water quality standards, and wetlands protection criteria?*
- *Environmental conservation goals: Will the proposal advance the overall environmental goals and objectives of the community?*

7. *Economic Considerations.*
   - *Availability of funds: Will the measure require Federal or other outside funding sources? Are local funds available? Can in-kind services reduce local obligations? What is the projected availability of required funds during the timeframe for implementation? Where funding is not apparently available, should the project still be considered but at a lower priority?*
   - *Benefits to be derived from the proposed measure: Will the measure likely reduce dollar losses from property damages in the event of a hazard? To what degree?*
   - *Costs: Are the costs reasonable in relation to the likely benefits? Do economic benefits to the community outweigh estimated project costs? What cost reduction alternatives might be available?*
   - *Economic feasibility: Have the costs and benefits of the preferred measure been compared against other alternatives? What is the economic impact of the no-action alternative? Is this the most economically effective solution?*
   - *Impact on local economy: Will the proposed measure improve local economic activities? What impact might the measure have on the tax base?*
   - *Economic development goals: Will the proposal advance the overall economic goals and objectives of the community?*

6.5.2 Mitigation Prioritization

Prioritization of the mitigation actions based on the findings of the STAPLEE evaluation was done at the same time as the review of the mitigation measures. The jurisdictions were asked to consider the mitigation measures that were chosen and prioritize them as high, medium, or low priority. If a measure under consideration was found to be financially feasible and had high ratings, it was given a higher priority for implementation than measures that fell lower in the rating. Moreover, a general economic evaluation was performed as part of the STAPLEE method, as described above. Weighing potential economic benefits of reducing damages against the cost from the impacts of the hazards made it possible to select among competing projects. Especially important to the selection process is the estimated cost and availability of funds through local sources and potential FEMA Hazard

Mitigation Assistance (HMA) grant programs. Prior to implementation of projects proposed for HMA funding, a detailed benefit-cost analysis (BCA) will be required.

6.5.3 Mitigation Implementation and Administration

The jurisdictions were asked to provide a general completion schedule, assign administrative responsibility for carrying out the measures, estimate costs if possible, and identify potential funding sources. The timelines for completion ranged from short-range (2 years or less) to long-range (more than 4 years) or ongoing which are measures that are carried out through the 5-year timeframe.

The person listed under "Lead Responsibility for Carrying Out Measure" is the department, agency, or position within an organization who would oversee or carry out the measure. The Local Floodplain Manager is an administrator designated through the NFIP as the person responsible for enforcing the local ordinance and may be the local engineer or local building official.

Estimated costs and potential funding sources are provided if they are known. FEMA Hazard Mitigation Assistance funds, where noted as a possible funding source, are subject to final eligibility determination, including, among other eligibility criteria, a positive benefit/cost analysis and the availability of funds. It will be imperative that when disaster funds are available that the community action programs be reviewed and any mitigation measures that can be addressed through the use of available funds be strongly considered.

More information about funding sources for mitigation actions can be found at the State EMA's hazard mitigation grant program website: https://ema.alabama.gov/hazard-mitigation-grant-program/ or by contacting the State Hazard Mitigation Officer at telephone number 205-280-2312.

6.6 2020 – 2025 Marshall County Multi-Jurisdiction Mitigation Action Program

The comprehensive 2020-2025 Marshall County Multi-Jurisdiction Mitigation Action Program is presented in Table 6-7 and it presents all the goals, objectives and measures chosen by each of the participating jurisdictions and the school systems. The communities employing the measure are listed on the table and if a school board has chosen to include the measure in their mitigation plan, they are included under the communities heading. Also included in the program are the hazards the measures address, whether they affect new or existing buildings or infrastructure and if they are actions or projects. The Community Action Programs in Volume III breaks out the same mitigation goals, objectives, and mitigation measures by community and adds the priority, timeframe for completion, and responsibility for implementation of the measures and supplements Table 6-7.

While mitigation refers to actions employed to reduce or eliminate risks, and not to preparing for or responding to hazard events, a number of mitigation measures can cross over into both mitigation and response. For example, responding to a flooding event by warning people about the danger to prevent injury or death, is both a response and a mitigation measure. Similar actions have been included in the mitigation strategies.

Table 6-7. 2020-2025 Marshall County Multi-Jurisdictional Mitigation Action Program

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
1	**Goal for Prevention. Manage the development of land and buildings to minimize risks of loss due to multiple hazards.**				
1.1	**Comprehensive Plans and Smart Growth. Establish an active comprehensive planning program that is consistent with Smart Growth principles of sustainable community development.**				
1.1.1	Maintain up-to-date comprehensive plan.	Albertville, Arab, Boaz, Guntersville	All	Both	Action
1.1.2	Integrate the findings and recommendations of this hazard mitigation plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	Albertville, Arab, Boaz, Grant, Guntersville	All	Both	Action
1.1.3	Prepare a five-year capital improvements plan (CIP) to include capital projects that implement the natural, human-caused, and technological hazard element of the community's comprehensive plan or projects identified in the Community Mitigation Action Program of this multi-hazard mitigation plan.	Albertville, Arab, Grant, Guntersville	All	Both	Action
1.2	**Planning Studies. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**				
1.2.1	Carry out detailed planning and engineering studies for sub-basins in critical flood hazard areas to determine watershed-wide solutions to flooding.	Albertville, Arab, Boaz	Flooding	Both	Action
1.2.2	Evaluate elevation and culvert sizing of existing roadways in flash flood prone areas to ensure compliance with current standards for design year floods and develop a program for construction upgrades as appropriate.	Albertville, Arab, Boaz	Flooding	Existing	Action
1.2.3	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	Marshall County, Albertville, Boaz, Union Grove	Flooding	Existing	Action
1.2.4	Identify existing culturally or socially significant structures within participating jurisdictions that have the most potential for losses from disaster events and identify needed structural upgrades.	Marshall County, Albertville, Boaz, Union Grove	All*	Both	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
1.2.5	Inventory and map existing fire hydrants and piping throughout the county and identify areas in need of new fire hydrants and/or areas of insufficient water pressure for fire suppression. Make maps available to all fire departments.	Marshall County, Boaz, Douglas, Grant, Guntersville, Union Grove	Wildfires	Existing	Action
1.2.6	Update Wide Hazardous Flow Study, Fixed Site Tier II Reporting Facilities every 3 years.	Marshall County, Grant, Guntersville	Technological	Existing	Action
1.2.7	Assist the Alabama Forestry Commission with their Community Wildfire Plan for Marshall County and its jurisdictions.	All	Wildfires	Both	Action
1.2.8	Evaluate bridges and culverts in the jurisdiction for structural integrity and soundness, conduct engineering studies if needed, and recommend remediation through repair or replacement.	All	Flooding Severe Storms Tornadoes Earthquakes	Existing	Action
1.2.9	Evaluate areas of possible and previous soil instability to determine how to best prevent future landslide events. Conduct engineering studies if needed and recommend remediation.	All	Landslides	Existing	Action
1.3	**Zoning and Subdivision Regulations. Establish effective zoning and subdivision controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**				
1.3.1	Require/encourage new subdivisions to implement fire reduction measures such as maintaining minimum intervals between structures, providing firebreaks, on-site water storage, wide roads and multiple accesses are measures to reduce fire risks.	Marshall County, Boaz, Grant, Guntersville	Wildfires	New	Action
1.3.2	Update zoning regulations to include maximum impervious surface standards for non-residential developments.	Albertville, Arab, Boaz	Flooding	New	Action
1.3.3	Update zoning regulations to protect hazardous slopes, thereby preventing landslides and preserving vegetation to filter runoff for water quality protection.	Arab	Landslides	N/A	Action
1.3.4	Evaluate additional land use restrictions within designated flood zones, such as prohibition of storage of buoyant materials, storage of hazardous materials, and restrictive development of flood ways, among others.	Marshall County, Boaz	Flooding	Both	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
1.3.5	Require delineation of floodplain fringe, floodways, and wetlands on all plans submitted with a permit for development within a floodplain.	Marshall County, Boaz	Flooding	Both	Action
1.3.6	Enact local ordinances that require community storm shelters within sizeable mobile home parks, apartment complexes, RV parks and other planned communities.	Boaz, Grant, Union Grove	Tornadoes Hurricanes Severe Storms	New	Action
1.4	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from multi-hazard damages.**				
1.4.1	Promote good construction practices and proper code enforcement to mitigate structural failures during disaster events.	Albertville, Arab, Boaz, Guntersville, Union Grove	Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused	New	Action
1.4.2	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	Albertville, Arab, Boaz, Guntersville, Grant	Tornadoes Hurricanes Severe Storms Earthquakes	Existing	Action
1.4.3	Evaluate and revise as appropriate, building codes for roof construction to maximize protection against wind damage from hurricanes, tornadoes, and severe storms; encourage installation of “hurricane clips.”	Albertville, Arab, Boaz, Guntersville	Tornadoes Hurricanes Severe Storms	New	Action
1.4.4	Through local subdivision and land development regulations require the placement of all new utility lines underground for large residential subdivisions and commercial developments.	Albertville, Arab, Boaz, Guntersville, Grant	Tornadoes Severe Storms Winter Storms Hurricanes	New	Action
1.4.5	Review fire safety ordinances to ensure they properly regulate open burning.	Albertville, Arab, Boaz, Guntersville, Grant, Union Grove	Wildfires	Both	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
1.4.6	Require the construction of safe rooms within new public buildings, such as new schools, libraries, community centers, and other public buildings by amending applicable ordinances and regulations.	Boaz, Guntersville, Grant, Union Grove	Tornadoes Hurricanes Severe Storms Human-Caused Technological	New	Action
1.4.7	Encourage state lawmakers along with the homebuilder's association, home builder's licensure board, and the Alabama General Contractors Board to pass a regulation requiring the establishment of building safety departments at the county to level to enforce safer building practices in unincorporated areas, to assist in eliminating blight and substandard, unsafe housing.	Boaz	Tornadoes Hurricanes Severe Storms Earthquakes Flooding	New	Action
1.5	**Floodplain Management Regulations and Programs. Effectively administer and enforce local floodplain management regulations.**				
1.5.1	Assist the state in promoting the adoption of a uniform flood hazard prevention ordinance among all NFIP communities.	Marshall County, Arab, Boaz	Flooding	Both	Action
1.5.2	Develop guidelines for management of development around flood prone areas and other areas of high flood mitigation values, such as, wetlands, floodplain corridors, upland storage, closed depressional basins and areas of high filtration potential.	Marshall County, Albertville, Boaz, Grant, Guntersville	Flooding	New	Action
1.5.3	Improve flood risk assessment by monitoring flood events and damages, documenting high water marks post event, verification of FEMA's repetitive loss inventory and revising and updating regulatory floodplain maps.	Marshall County, Albertville, Arab, Boaz, Grant, Guntersville	Flooding	Both	Action
1.5.4	Train local floodplain managers through programs offered by the State Floodplain Coordinator and FEMA's training center in Emmitsburg, Maryland.	Marshall County, Albertville, Arab, Boaz, Grant, Guntersville	Flooding	Both	Action
1.5.5	Maintain membership for locally designated floodplain managers in the Association of State Floodplain Managers and the Alabama Association Floodplain Managers and encourage active participation.	Marshall County, Albertville, Arab, Boaz, Grant, Guntersville	Flooding	Both	Action
1.5.6	Maintain a library of technical assistance and guidance materials to support the local floodplain manager.	Marshall County, Albertville, Boaz	Flooding	Both	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
1.5.7	Encourage interagency collaboration in management of beaver populations where beaver activities compromise drainage structures and transportation routes.	Marshall County, Boaz, Douglas	Flooding	Existing	Action
1.5.8	Update local floodplain ordinance for compliance with current NFIP standards.	Marshall County, Albertville, Arab, Boaz, Grant, Guntersville	Flooding	Both	Action
1.5.9	Continue ongoing relations with the State NFIP Coordinator in relation to floodplain management.	Marshall County, Albertville, Arab, Boaz, Grant, Guntersville	Flooding	Both	Action
1.6	**Community Rating System Program (CRS). Increase participation of NFIP member communities in the CRS Program.**				
1.6.1	Apply for membership in the CRS Program.	Marshall County, Albertville, Arab, Boaz, Grant, Guntersville	Flooding	Both	Action
1.7	**Storm Water Management Regulations. Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**				
1.7.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	Albertville, Arab, Boaz	Flooding	Both	Action
1.7.2	Develop, adopt, and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Marshall County, Albertville, Arab, Boaz, Grant	Flooding	Both	Action
1.8	**Open Space Preservation. Minimize disturbances of natural land features and increased storm water runoff through regulations that maintain critical natural features such as open space for drainage, parks, conservation areas, and landscaping.**				
1.8.1	Examine regulatory options and feasibility of requiring open space areas for drainage control, recreation, and landscaping.	Albertville, Arab, Boaz, Union Grove	Flooding	New	Action
1.9	**Landscape Ordinances. Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff, damage from wind events, mitigate wildfires and improve urban aesthetics.**				
1.9.1	Review and revise as necessary, landscaping standards for parking lots that reduce the size of impervious surfaces and encourage natural infiltration of rainwater.	Arab, Boaz	Flooding	New	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
1.9.2	Establish ordinances to help mitigate fire hazards related to fuel buildup due to disasters.	Guntersville, Grant, Union Grove	Wildfires	Both	Action
1.9.3	Establish ordinances for the planting of new urban forests or replacement of damaged urban forests using disaster resistant tree species to mitigate sediment and erosion control, wind damage and to help beautify and promote healthy urban environments and reduce heating, cooling, and storm runoff costs.	Union Grove	Tornadoes Hurricanes Severe Storms Landslides	Both	Action
1.10	**Critical Facilities Assessments. Perform assessments of critical facilities (hospitals, schools, fire and police stations, emergency operation centers, special needs housing, and others) to address building and site vulnerabilities to hazards, identify damage control and retrofit measures to reduce vulnerability to damage and disruption of operations during severe weather and other natural and human-caused disaster events.**				
1.10.1	Perform vulnerability assessments of critical facilities, including education facilities, to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards; i.e., protective film inside windows.	Albertville, Guntersville, Union Grove, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	All *	Existing	Action
1.10.2	Conduct wildfire vulnerability assessments of critical facilities and other properties in these risk areas and prepare a comprehensive inventory to identify high and moderate wildfire risk areas.	Marshall County, Douglas, Guntersville	Wildfire	Both	Action
1.10.3	Inspect security measures around critical facilities for areas of concern (i.e., cut away areas in security fencing, inoperable cameras) and develop a plan to address the concerns.	Marshall County, Boaz, Douglas, Grant, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Human-Caused	Existing	Action
1.10.4	Perform annual penetration and vulnerability assessments of log files and wire data.	Marshall County, Boaz, Douglas, Grant, Union Grove, Arab Schools, Guntersville Schools, Marshall Co Schools	Human-Caused	Both	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
1.10.5	Encourage water suppliers to assess vulnerability of existing supply systems and share that information with local governments.	Marshall County, Boaz, Douglas, Albertville, Grant, Guntersville, Union Grove	Human-Caused	Existing	Action
1.10.6	Establish Threat Assessment Teams on each campus.	Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Human-Caused	Both	Action
1.11	**Geographic Information Systems (GIS) and Information Management. Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories to aid in planning, hazard mitigation and incident reporting.**				
1.11.1	Maintain a centralized, countywide hazards and risk assessment database that is accessible to local planners and emergency management personnel, including such data as, flood zones (FIRM), geohazards, tornado tracks, disaster events and their extents, major drainage structures and a comprehensive inventory of critical facilities, including points of distribution within all jurisdictions. If applicable, add to GIS mapping.	Albertville, Arab, Boaz, Grant, Union Grove	All	Both	Action
1.11.2	Mark depths of flooding and storm surge immediately after each event and record the data with GIS mapping if available.	Marshall County, Albertville, Arab, Boaz, Grant, Guntersville, Union Grove	Flooding	Both	Action
1.11.3	Maintain a comprehensive inventory of dams and failure inundation areas within the county and jurisdictions. If applicable, add to GIS mapping.	Marshall County, Guntersville, Union Grove	Dam Failure	Both	Action
1.11.4	Provide property assessments of areas impacted by hazards for damage/incident reports. If applicable, add to GIS mapping.	Marshall County, Boaz, Douglas, Union Grove	All	Both	Action
1.11.5	Develop a centralized County database of all safe rooms and shelters, both pre-disaster and post-disaster, open to the public for all jurisdictions. Include and update those locations in GIS if applicable.	Marshall County, Boaz, Douglas, Grant, Guntersville, Union Grove	Tornadoes Hurricanes Severe Storms Earthquakes Technological	Existing	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
1.11.6	Keep up-to-date lists of addresses with private safe rooms and shelters to assist fire departments and emergency services agencies. Coordinate the distribution of these lists to the appropriate local government officials.	Marshall County, Albertville, Boaz, Douglas, Grant, Guntersville, Union Grove	Tornadoes Hurricanes Severe Storms Earthquakes	Both	Action
1.11.7	Maintain a listing of locations of special needs groups, including the elderly and those with Alzheimer's. Disseminate that information to emergency personnel.	All Jurisdictions	All	Both	Action
1.11.8	Establish a uniform damage reporting procedure for all jurisdictions to utilize in Marshall County with the Marshall County Emergency Management Agency as the clearinghouse for damage assessment data following disaster events, including non-structural impacts.	All Jurisdictions	All	Both	Action
1.11.9	Establish a data management system to identify drought-related agricultural losses so subsidy programs can be utilized to their full advantage.	Marshall County, Boaz	Drought	N/A	Action
1.12	**Dam Safety Management. Establish a comprehensive dam safety program.**				
1.12.1	Support legislation to establish a State dam safety program.	Arab, Guntersville, Union Grove	Dam or Levee Failure	Both	Action
1.13	**Prescribed Burn Regulations and Wildfire Management Programs. Create regulations and programs to reduce storm debris.**				
1.13.1	Support legislation to enact regulations for the timber industry to conduct prescribed burns after clearing land to lessen the possibility of wildfires.	Marshall County, Boaz, Douglas, Grant, Guntersville, Union Grove	Wildfires	N/A	Action
1.13.2	Encourage programs to conduct prescribed burns of large undeveloped areas of downed trees from disaster events to lessen the possibility of wildfires.	Marshall County, Boaz, Douglas, Guntersville, Union Grove	Wildfires	N/A	Action

	Goal, Objectives and Mitigation Measures	Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
1.14	**Emergency Operations Plan.**				
1.14.1	Maintain and update emergency operations plans.	Marshall County, Albertville, Arab, Boaz, Douglas, Guntersville, Union Grove, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	All	Both	Action
2	**Goal for Human Welfare and Property Protection: Protect people, animals, structures, and contents from the damaging effects of hazards.**				
2.1	**Building Relocation. Relocate buildings out of hazardous flood areas to safeguard against damages and establish permanent open space.**				
2.1.1	Relocate buildings out of hazardous flood areas, with emphasis on pre-FIRM residential buildings, where deemed more cost effective than property acquisition or building elevation.	Albertville	Flooding	Existing	Project
2.2	**Building Acquisition. Acquire flood prone buildings and properties and establish permanent open space.**				
2.2.1	Utilize the most recent NFIP repetitive loss property list, and other appropriate sources, to create and maintain a prioritized list of acquisition mitigation projects based on claims paid.	Albertville	Flooding	Existing	Action
2.2.2	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	Albertville	Flooding	Existing	Project
2.2.3	Acquire and relocate or demolish structures located in Landslide Hazard Areas and enforce permanent restrictions after land acquisition and structure removal.	Albertville	Landslide	Existing	Project
2.3	**Building Elevation. Elevate buildings in hazardous flood areas to safeguard against damages.**				
2.3.1	Elevate certain buildings in flood prone areas where acquisition or relocation is not feasible, with emphasis on Pre-FIRM buildings.	Albertville	Flooding	Existing	Project

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
2.4	**Building Retrofits. Retrofit vulnerable buildings and their surroundings to protect against multiple hazard damages, including flooding, high winds, tornadoes, hurricanes, severe storms, earthquakes, and human-caused hazards.**				
2.4.1	Retrofit existing buildings against potential damages from natural and human-caused hazards.	Boaz, Douglas, Grant	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused	Existing	Action
2.5	**Flood Proofing. Encourage flood proofing of buildings in hazardous flood areas to safeguard against damages.**				
2.5.1	Flood proof pre-FIRM non-residential buildings, where feasible.	Albertville	Flooding	Existing	Project
2.5.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	Albertville	Flooding	Both	Project
2.6	**Critical Facilities Protection. Protect critical facilities from potential damages and occupants from harm in the event of hazards through retrofits or relocations of existing facilities located in high-risk zones, construction of new facilities, or implementation of security measures for maximum protection from all hazards.**				
2.6.1	Retrofit critical facilities and infrastructure against potential damages from hazards.	Albertville, Douglas, Grant, Guntersville, Union Grove	All*	Existing	Project
2.6.2	Encourage the relocation of existing utility lines underground, where feasible and cost effective.	Albertville, Boaz, Guntersville, Union Grove	Tornadoes Severe Storms Winter Storms Hurricanes	Existing	Action
2.6.3	Install lightning and/or surge protection on existing critical facilities.	Albertville, Grant, Guntersville, Marshall Co Schools	Lightning	Existing	Project
2.6.4	Require lightning and/or surge protection on new critical facilities.	Marshall County, Albertville, Grant, Guntersville, Union Grove	Lightning	New	Project

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
2.6.5	Conduct tree trimming programs along utility lines.	Albertville, Arab, Boaz	Tornadoes Hurricanes Severe Storms Winter Storms	Both	Project
2.6.6	Encourage the planting of species that are less susceptible to damage and ensure that trees are planted far from above ground utility lines and buildings.	Marshall County, Albertville, Boaz, Douglas	Tornadoes Hurricanes Severe Storms Winter Storms	Both	Action
2.6.7	Encourage the enhancement of the security of areas surrounding public facilities, including education facilities. Such measures include replacing or removing landscaping that provides cover for attacks, installing motion activated lighting, secure parking lots through fencing and adequate lighting.	Marshall County, Albertville, Arab, Boaz, Douglas, Grant, Union Grove, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Human-Caused	Existing	Project
2.6.8	Encourage structural changes to secure buildings, i.e., replace vulnerable doors, install automatic door locks for after hours, install alarms and panic alarms, install CCTVs throughout facilities.	Marshall County, Albertville, Boaz, Douglas, Grant, Union Grove, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Human-Caused	Existing	Project
2.6.9	Install a public address system throughout public buildings for hazard warnings and shelter-in-place announcements.	Marshall County, Albertville, Boaz, Douglas, Grant, Guntersville, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Dam Failure Tornadoes Hurricanes Severe Storms Human-Caused Technological	Both	Project

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
2.6.10	Minimize visitors' access to buildings and provide badges.	Marshall County, Albertville, Arab, Boaz, Douglas, Guntersville, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Human-Caused	Both	Action
2.6.11	Monitor inflow/outflow of network activity on computer systems in critical facilities to protect against cyberterrorism.	ALL	Human-Caused	Both	Action
2.6.12	Utilize the DHS' free assessment tool for cybersecurity for local governments to find weak areas in cybersecurity and address the issues found.	Marshall County, Albertville, Arab, Boaz, Douglas, Grant	Human-Caused	Both	Action
2.6.13	Ensure computer firewalls, virus protections, etc. are up-to-date.	Arab Schools, Guntersville Schools, Marshall Co Schools	Human-Caused	Both	Action
2.7	**Emergency Power Generation. Assure uninterrupted power supplies during emergency events.**				
2.7.1	Install or encourage the installation of backup power generators for critical facilities, including radio stations, and fuel stations.	All	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	Existing	Project
2.7.2	Deploy portable generators to serve as miniature sub-stations to help rapidly restore power to at-risk citizens after a hazard event.	Marshall County, Boaz, Douglas, Grant, Guntersville, Union Grove	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	Both	Project

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
2.7.3	Ensure all critical facilities, including facilities serving the elderly and special needs residents test generators on a monthly basis.	Marshall County	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	Existing	Action
2.8	**<u>Community Shelters and Safe Rooms</u>: Provide shelter from multiple hazards for the safety of community residents.**				
2.8.1	Work with county and city leaders in developing standardized procedures for identifying shelters as pre-disaster and post-disaster shelters or safe rooms.	Marshall County, Albertville, Boaz, Douglas, Grant, Guntersville, Union Grove, Marshall Co Schools	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Both	Action
2.8.2	Review existing public shelters and safe rooms in public buildings including schools and recommend new locations if and where there are coverage gaps. Include evaluations on ADA compliance and sheltering of animals.	Marshall County, Albertville, Boaz, Douglas, Grant, Guntersville, Union Grove Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Existing	Action
2.8.3	Work with the American Red Cross (ARC) in developing "Memorandums of Understanding" (MOUs) with facility owners that serve as shelters.	Marshall County, Albertville, Boaz, Douglas, Guntersville, Union Grove, Guntersville Schools, Marshall Co Schools	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Existing	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
2.8.4	Determine how to accommodate individuals with special needs both in the emergency operations plan for the shelter or safe room and in the design of the shelter or safe room, including compliance with the American with Disabilities Act (ADA).	Marshall County, Albertville, Arab, Boaz, Douglas, Guntersville, Union Grove, Arab Schools, Guntersville Schools, Marshall Co Schools	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Both	Action
2.8.5	Evaluate the need for severe weather plans and shelters in essential facilities and other establishments serving the public (e.g., schools, hospitals, and critical facilities).	Marshall County, Arab, Boaz, Douglas, Grant, Guntersville, Union Grove, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Both	Action
2.8.6	Construct new community safe rooms in accessible locations and add safe rooms within new and existing public and institutional buildings, such as schools, colleges and universities, senior centers, community centers, hospitals, and government buildings.	Albertville, Arab, Boaz, Union Grove, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Hurricanes Tornadoes Severe Storms Earthquakes Human-Caused Technological	New	Project
2.8.7	Establish a program for subsidizing individual and community safe room construction in existing facilities.	Marshall County, Arab, Douglas, Union Grove, Marshall Co Schools	Hurricanes Tornadoes Severe Storms Earthquakes	Existing	Project
2.8.8	Encourage the construction of safe rooms in new and existing homes and buildings.	Marshall County, Albertville, Arab, Boaz, Guntersville, Union Grove, Marshall Co Schools	Hurricanes Tornadoes Severe Storms Earthquakes	Both	Project
2.8.9	Determine which areas at important facilities such as schools and daycare centers are the best locations for occupants during a disaster. Identify and provide directions to the designated “safe place.”	ALL	Tornadoes Hurricanes Severe Storms Technological	Both	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
2.8.10	Ensure all public buildings have a refuge plan of where to send people during times of disasters. Encourage posting of the plan in places accessible to the public.	Marshall County, Arab, Boaz, Douglas, Grant, Guntersville, Union Grove, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Dam Failure Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	Both	Action
2.8.11	Establish mutual agreements with other jurisdictions and agencies to help with sheltering of animals during disasters.	Marshall County, Albertville, Arab, Boaz, Douglas, Union Grove	Tornadoes Hurricanes Severe Storms	N/A	Action
2.8.12	Evaluate existing public shelters and safe places for areas for sheltering pets.	Marshall County, Albertville, Arab, Boaz, Douglas, Grant, Union Grove, Marshall Co Schools	Tornadoes Hurricanes Severe Storms	Existing	Action
2.8.13	Evaluate future plans for public shelters and safe places for sheltering pets.	Marshall County, Albertville, Arab, Boaz, Douglas, Grant, Union Grove, Marshall Co Schools	Tornadoes Hurricanes Severe Storms	New	Action
2.8.14	Ensure all schools have a place of refuge plan for sporting events held outside and proper posting on where it is located.	Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Tornadoes Hurricanes Severe Storms Human-Caused Technological	Both	Action
2.9	**Human Health and Welfare Programs. Programs that protect the health of individuals from the effects of hazards.**				
2.9.1	Increase collaboration between government and community organizations regarding containment and response plans for epidemic events involving humans.	Marshall County, Arab, Boaz, Douglas, Grant, Guntersville, Union Grove	Pandemic	N/A	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
2.9.2	Continue to support the Area 2 Region Public Health Team in planning and training events such as the Drive-Thru-Flu clinic Exercise, Point of Distribution SNS Exercises and other MMRS activities.	Marshall County, Arab, Boaz, Douglas, Grant, Guntersville	Pandemic	N/A	Action
2.9.3	Identify and secure resources to build the appropriate medical stockpile of medicines and medical supplies to address sizable epidemics through the MMRS-SNS and Area 2 Public Health Plans	Marshall County, Arab, Boaz, Douglas, Grant, Guntersville	Pandemic	N/A	Action
2.9.4	Educate the public about vaccines and immunizations.	Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Pandemic	N/A	Action
2.9.5	Require school systems to inform parents/guardians about illness at the schools.	Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Pandemic	N/A	Action
2.9.6	Ensure school buses include air conditioning when purchasing replacements buses.	Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Extreme Heat	N/A	Action
3	**Goal for Education, Outreach and Awareness. Educate and inform the public, and government and agency staff about the risks of hazards and ways to reduce threats to life and property.**				
3.1	**Community Hazard Mitigation Plan Distribution. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**				
3.1.1	Distribute the 2020 plan to local officials, stakeholders, and interested individuals through internet download.	All Jurisdictions	All	Both	Action
3.2	**Technical Assistance. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**				
3.2.1	Provide technical assistance to owners of vulnerable buildings to advise on available building retrofits to protect against hazards damages.	Arab, Boaz, Guntersville, Union Grove	Flooding Tornadoes Hurricanes Severe Storms Earthquakes	Existing	Action

	Goal, Objectives and Mitigation Measures	Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
3.3	**<u>Flood Map Information.</u> Increase public access to Flood Insurance Rate Map (FIRM) information.**				
3.3.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications, newspaper announcements and other media related outreach events.	Marshall County, Albertville, Arab, Boaz, Grant, Guntersville	Flooding	Both	Action
3.3.2	Inform builders and property owners about complying with the latest NFIP standards.	Marshall County, Albertville, Arab, Boaz, Grant, Guntersville	Flooding	Both	Action
3.4	**<u>Hazard Insurance Awareness.</u> Increase public awareness of flood insurance and special riders that may be required for earthquake, landslide, sinkhole, and other damages typically not covered by standard property protection policies.**				
3.4.1	Promote the purchase of insurance coverage by property owners and renters for flood damages and other hazards in high-risk areas.	Marshall County, Douglas	Flooding Earthquakes Landslides Sinkholes Human-Caused	Existing	Action
3.4.2	Partner with insurance companies to disseminate information on hazards to citizens, i.e., availability of flood insurance in flood prone areas.	Marshall County, Boaz	Flooding Earthquakes Landslides Sinkholes Human-Caused	Existing	Action
3.4.3	Promote the purchase of crop insurance by farmers to cover potential losses due to drought.	Marshall County, Douglas	Drought	Existing	Action
3.5	**<u>Publication Distribution.</u> Use local library resources and other agencies/departments to educate the public on hazard risks and mitigation alternatives through distribution of publications on hazards and hazard mitigation.**				
3.5.1	Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.	Marshall County, Albertville, Arab, Boaz, Grant	All	Both	Action
3.5.2	Distribute FEMA Publication 320 - Taking Shelter from the Storm: Building a Safe Room in Your House - through building permit and inspection offices.	Marshall County, Arab, Boaz, Douglas, Union Grove	Tornadoes Hurricanes Severe Storms Earthquakes	Both	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
3.5.3	Distribute awareness materials to citizens, builders and business owners inquiring about flood problems or other flood related questions.	Albertville, Arab, Boaz, Union Grove	Flooding	Both	Action
3.5.4	Implement and distribute "Drought Dos and Don'ts" to the general public.	Marshall County, Grant, Union Grove	Drought	N/A	Action
3.5.5	Assist the state and the Alabama Cooperative Extension Systems in educating stakeholders and the public about resources available through http://drought.aces.edu regarding the risk of drought and how to prepare for and mitigate the effects of drought.	Marshall County	Drought	N/A	Action
3.5.6	Promote technical information from agencies such as the Insurance Institute for Business and Home Safety and Federal Alliance for Safe Homes.	Marshall County, Arab, Douglas, Grant, Union Grove	Tornadoes Hurricanes Severe Storms Earthquakes	Both	Action
3.5.7	Provide emergency preparedness information about the protection and care of animals during extended periods of extreme heat or cold.	Marshall County, Albertville, Arab, Boaz, Douglas, Grant, Union Grove	Extreme Heat Extreme Cold	N/A	Action
3.5.8	Provide awareness materials regarding the appropriate actions to take in the event of a hazardous material release.	Marshall County, Albertville, Arab, Boaz, Douglas, Grant, Union Grove	Human-Caused	N/A	Action
3.6	**Outreach Projects. Conduct regular public events to inform the public of hazards and mitigation measures.**				
3.6.1	Continue to participate in environmental awareness events to provide the public information on hazard exposure and mitigation measures, such as City/County Day, Hurricane Awareness Week, and severe Weather Week.	Marshall County, Boaz, Douglas, Grant, Union Grove	All	Both	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
3.6.2	Distribute material via the internet and other media, and other outreach activities and workshops to encourage families and individuals to implement hazard mitigation measures in their homes.	Marshall County, Albertville, Boaz, Douglas, Grant, Union Grove	All	Existing	Action
3.6.3	Promote disaster resilience within the business community through workshops, educational materials, and planning guides.	Marshall County	All	Both	Action
3.6.4	Promote awareness of human-caused and technological hazards through workshops, educational materials and planning guides to businesses and the general public.	Marshall County, Douglas, Union Grove	Human-Caused Technological	Both	Action
3.6.5	Develop a fire safety, protection, and prevention outreach program for builders, developers, and the general public.	Boaz, Guntersville, Union Grove	Wildfire	Both	Action
3.6.6	Develop an educational public awareness campaign informing citizens of land management and landscaping options to limit wildfire spread.	Marshall County, Guntersville, Douglas	Wildfire	Both	Action
3.6.7	Educate homeowners about the urban – wildland interface and proper plantings and landscaping practices to prevent wildfire destruction.	Marshall County, Guntersville, Douglas, Union Grove	Wildfire	Both	Action
3.7	**<u>Outreach Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**				
3.7.1	Distribute hazard mitigation brochures to students through area schools.	Grant, Arab Schools, Guntersville Schools, Marshall Co Schools	All	Both	Action
3.7.2	Educate students and the public about the “See Something, Say Something” program, including who to contact about suspicions.	Marshall County, Boaz, Douglas, Union Grove, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Human-Caused	N/A	Action
3.7.3	Promote the education of citizens on water saving techniques through the local water boards and area schools.	Marshall County, Boaz, Douglas, Grant, Union Grove	Drought	N/A	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
3.7.4	Promote the education of farmers on groundwater withdrawal and soil and water conservation practices with programs offered by such agencies as the cooperative extension service and USDA.	Marshall County	Drought	N/A	Action
3.7.5	Provide emergency preparedness information for extreme temperature events through an active educational outreach program with specific plans and procedures for senior citizens and people with special needs.	Marshall County, Arab, Boaz, Douglas, Grant, Guntersville, Union Grove	Extreme Cold Extreme Heat	N/A	Action
3.7.6	Educate homeowners about structural and non-structural retrofitting of homes vulnerable to certain hazards.	Marshall County, Boaz, Douglas, Union Grove	Tornadoes Hurricanes Severe Storms Earthquakes Flooding	Both	Action
3.7.7	Educate those in areas without building codes about safer building practices such as the use of fire-resistant materials in construction.	Marshall County, Douglas, Grant, Guntersville	Tornadoes Hurricanes Severe Storms Earthquakes Wildfire	Both	Action
3.7.8	Educate the citizens about proper procedures for sheltering in place.	Marshall County, Albertville, Arab, Douglas, Grant, Union Grove	Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	N/A	Action
3.7.9	Educate employees in critical facilities about cybersecurity.	Marshall County, Albertville, Arab, Boaz, Douglas, Grant, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Human-Caused	Both	Action
3.7.10	Enhance public safety through awareness and outreach materials to the public with regards to pandemics.	Marshall County, Arab, Albertville, Boaz, Douglas, Union Grove	Pandemic	N/A	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
3.7.11	Educate the public about existing flood warning systems such as Everbridge.	Marshall County, Albertville, Boaz, Douglas, Union Grove	Flooding	N/A	Action
3.7.12	Assist the State EMA with notifying the public about dam inundation areas and explaining the risks associated with dam or levee failure in Marshall County.	Marshall County, Guntersville, Union Grove	Dam Failure	Existing	Action
3.7.13	Educate staff members on proper mitigation measures of pandemic preparedness	Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Pandemic	N/A	Action
3.7.14	Educate staff members for the utilization of virtual resources for virtual and/or remote learning or communications during closures due to pandemics or other hazards.	Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Pandemic Human-Caused Technological	N/A	Action
3.7.15	Upgrade technology devices for students and teachers for utilization during virtual and/or remote learning.	Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Pandemic	N/A	Project
3.8	**Training and Webinars. Attend training and educational webinars on mitigation of national human caused and technological hazard.**				
3.8.1	Train additional weather spotters.	Marshall County, Union Grove	Tornadoes Severe Storms Flooding Hurricanes	N/A	Action
3.8.2	Train additional ham radio operators for times of emergency.	Marshall County	Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	N/A	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
3.8.3	Organize local veterinarians to educate the public and emergency personnel through workshops on the handling of pets, livestock, and wild animals during disasters .	Marshall County, Arab, Douglas, Union Grove	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	N/A	Action
3.8.4	Enhance and expand training of fire departments in wildfire hazard areas.	Marshall County, Boaz, Douglas, Guntersville, Union Grove	Wildfire	Existing	Action
3.8.5	Train operators in snow removal to ensure adequate coverage during severe winter storm events.	Marshall County, Boaz, Union Grove	Winter Storms	Existing	Action
3.8.6	Promote training and attendance by employees at conferences and webinars sponsored by agencies such as FEMA, DHS, APHD, AEMA and the Marshall County EMA.	Marshall County, Albertville, Boaz, Grant, Guntersville, Union Grove, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	All	Both	Action
3.8.7	Encourage completion of the online course FEMA IS-907 on active shooters by employees in critical facilities.	Marshall County, Boaz, Grant, Guntersville, Union Grove, Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Human-Caused	N/A	Action
3.8.8	Encourage the participation of groups in programs offered by the Department of Homeland Security; such as courses on Targeted Violence and Terrorism Prevention.	Marshall County, Boaz, Douglas, Grant, Guntersville	Human-Caused	Both	Action
3.8.9	Encourage local agricultural businesses to participate in the Strategic Partnership Program for agroterrorism programs.	Marshall County, Boaz, Douglas	Human-Caused	N/A	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
3.8.10	Encourage participation by livestock and poultry farmers in programs offered by the USDA such as "Biosecurity for the Birds".	Marshall County, Douglas	Human-Caused	N/A	Action
3.8.11	Expand or participate in expanding traditional disaster exercises involving city and county emergency personnel to include airport and port personnel, infrastructure providers, hospitals, schools, and major employers.	Marshall County, Albertville, Boaz, Douglas, Guntersville, Union Grove	All	Existing	Action
3.9	**<u>Disaster Warning and Notification.</u> Improve public warning and notification systems.**				
3.9.1	Review existing outdoor warning siren coverage and recommend new locations if and where there are coverage gaps. Install new warning sirens in accordance with the plan recommendations.	Marshall County, Arab, Boaz, Douglas, Grant, Guntersville, Union Grove	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Both	Project
3.9.2	Upgrade siren-warning systems.	Marshall County, Arab, Boaz, Douglas, Guntersville, Union Grove	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused	Both	Project
3.9.3	Upgrade critical communications infrastructure.	Albertville, Arab, Boaz, Grant, Guntersville, Union Grove	All	Both	Project
3.9.4	Enter in agreements with surrounding jurisdictions to upgrade communications to the Project 25 Radio system.	Marshall County, Albertville, Arab, Boaz, Douglas, Guntersville, Union Grove	All	N/A	Action
3.9.5	Create a backup site with communications equipment for 911 services.	Marshall County, Albertville, Arab, Boaz, Guntersville	All	New	Project

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
3.9.6	Develop the capability to re-route communications from one jurisdiction's 911 communication tower to another jurisdiction's in the event of tower failure.	Marshall County, Albertville, Arab, Boaz, Guntersville	All	Existing	Project
3.9.7	Coordinate with utilities and transportation authorities to improve rapid communications between emergency services and the private sector when basic services might be disrupted during extended periods due to disasters.	Marshall County, Albertville, Arab, Boaz, Douglas, Guntersville	All	Both	Action
3.9.8	Establish procedures to warn facilities storing hazardous materials when a hazard event is likely to impact the facility to ensure safety procedures are enacted.	Marshall County, Albertville, Arab, Boaz, Douglas, Grant, Union Grove	Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Existing	Action
3.9.9	Evaluate the need for a unified fire advisory system to identify fire risk during extended periods of extreme heat.	Marshall County, Boaz, Guntersville, Union Grove	Wildfire	Existing	Action
3.9.10	Participate in the “Turn Around Don’t Drown” program by purchasing and installing signs in known flash flood locations.	Douglas, Boaz, Union Grove	Flooding	Existing	Project
3.9.11	Explore options for improving the ability of local units of government to report flooding and flash flooding events, receive information, respond, and request assistance.	Marshall County, Albertville, Arab, Boaz, Douglas, Grant, Guntersville	Flooding	Both	Action
3.9.12	Ensure first responders are aware of any chemicals stored at the school including those used in the science department.	Arab Schools, Boaz Schools, Guntersville Schools, Marshall Co Schools	Tornadoes Severe Storms Earthquakes Human-Caused	Both	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
3.10	**<u>Weather Radio Programs</u>. Improve public access to weather alerts.**				
3.10.1	Continue to promote the purchase and usage of NOAA weather radios in all schools, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries, and the general public, especially in homes with no outdoor warning siren coverage.	All	Tornadoes Hurricanes Severe Storms Flooding	Both	Action
3.10.2	Require/encourage the installation of weather radios in all public buildings, including schools, and places of public assembly.	Arab, Boaz, Douglas, Grant, Guntersville, Union Grove	Tornadoes Hurricanes Severe Storms Flooding	Both	Action
3.10.3	Distribute weather radios and emergency response instructions to municipal residents and businesses.	Marshall County, Albertville, Arab, Boaz, Grant, Union Grove	Tornadoes Hurricanes Severe Storms Flooding	Both	Action
3.10.4	Promote the use of weather radios in households and businesses.	All Jurisdictions	Tornadoes Hurricanes Severe Storms Flooding	Both	Action
3.11	**<u>Mass Media Relations and Websites</u>. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, on-line social networking, and government/agency websites to increase public awareness and distribute public information on hazard mitigation topics.**				
3.11.1	Maintain appropriate media relationships to ensure the public is informed of hazard threats and means to mitigate property damages and/or loss of life.	All Jurisdictions	All	Both	Action
3.11.2	Increase media coverage of threat and evacuation procedures during peak wildfire times of the year; distribute informational packages in high and moderate wildfire risk areas.	Marshall County, Douglas, Guntersville, Union Grove	Wildfire	Both	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
3.11.3	Expand the use of county and city-sponsored websites to disseminate hazard mitigation information.	Marshall County, Albertville, Arab, Boaz, Douglas, Guntersville, Union Grove	All	Both	Action
3.11.4	Include hazard information on school websites to disseminate hazard mitigation information with a focus on family safety.	Boaz Schools, Guntersville Schools, Marshall Co Schools	All		
4	**Goal for Natural Resources Protection. Preserve and restore the beneficial functions of the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.**				
4.1	**Open Space Easements and Acquisitions. Acquire easements and fee-simple ownership of environmentally beneficial lands, such as hillsides, floodplains, and wetlands to assure permanent protection of these natural resources.**				
4.1.1	Increase open space acquisitions through the FEMA HMA Grant Programs and other floodplain acquisition efforts.	Boaz	Flooding	Existing	Project
4.2	**River/Stream Corridor Restoration and Protection. Restore and protect river and stream corridors within areas.**				
4.2.1	Protect wetlands by preventing unsound development that would change their natural condition.	Marshall County, Albertville, Boaz, Douglas	Flooding	New	Action
4.2.2	Keep builders and developers informed of Federal wetlands permitting requirements of the Corps of Engineers.	Albertville, Boaz	Flooding	Both	Action
4.2.3	Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.	Albertville, Boaz	Flooding	Existing	Action
4.3	**Forestry Programs. Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wildfires inside and outside the urban environment.**				
4.3.1	Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).	Arab, Boaz, Union Grove	Flooding	Existing	Action
4.3.2	Increase overall green spaces in cities by planting disaster resistant trees with site and location taken into consideration.	Guntersville, Union Grove	Wildfire	Both	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
4.3.3	Develop maintenance programs to clear dead and dry bushes or trees to mitigate wildfires.	Marshall County, Douglas, Guntersville, Union Grove	Wildfire	Both	Action
4.3.4	Use controlled burns to decrease the amount of fuel load in the identified moderate and high wildfire hazard areas.	Marshall County, Arab, Guntersville	Wildfire	Both	Project
4.3.5	Encourage Volunteer Fire Departments to improve capabilities for responding to and extinguishing wildfires.	Marshall County, Douglas, Grant, Guntersville, Union Grove	Wildfire	Both	Action
4.4	**Water Resources Conservation Programs. Protect water quantity and quality through water conservation programs to mitigate the effects of droughts and assure uninterrupted potable water supplies.**				
4.4.1	Encourage water conservation through public outreach programs prior to a drought event.	Marshall County, Douglas, Grant, Union Grove	Drought	N/A	Action
4.4.2	Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.	Union Grove	Drought	Both	Project
4.4.3	Provide advice to jurisdictions on potential new sources of water during extreme drought.	Marshall County, Union Grove	Drought	N/A	Action
4.4.4	Encourage the implementation of programs by utilities for water metering and leak detection programs.	Marshall County, Grant, Union Grove	Drought	Both	Action
5	**Goal for Natural System and Infrastructure Improvement and Maintenance Projects. Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where feasible, cost effective, and environmentally suitable.**				
5.1	**Drainage System and Rights-of-Way Maintenance. Improve maintenance programs for streams and drainage ways.**				
5.1.1	Prepare and implement standard operating procedures and guidelines for drainage system maintenance. Ensure storm drains and ditches are not blocked and are able to receive water.	Albertville, Arab, Boaz	Flooding	Both	Action

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed (All * - Indicates all hazards except pandemics & infectious diseases)	Affects New or Existing Building or Infrastructure	Action or Project
5.1.2	Employ prescribed burns of natural debris along streams and in ditches to enhance storm drainage.	Marshall County, Douglas, Guntersville	Flooding	Both	Project
5.1.3	Develop and adopt winter maintenance procedures that include smart salting techniques and applying deicing agents before severe winter storms happen.	Marshall County, Boaz	Winter Storm	Both	Action
5.1.4	Collaborate with ALDOT in addressing drainage issues along state roadways.	Marshall County, Boaz, Albertville, Union Grove	Flooding	Both	Action
5.1.5	Repair or replace bridges and/or culverts in order to ensure public safety.	All	Flooding Severe Storms Tornadoes Earthquakes	Existing	Action
5.1.6	Shore up areas of past landslides and secure areas of potential landslide hazards to aid in the prevention of future events.	All	Landslides	Existing	Action
5.2	**<u>Reservoirs and Drainage System Improvements.</u> Control flooding through reservoirs and other structural improvements, where deemed cost effective and feasible, such as levees/floodwalls, diversions, channel modifications, dredging, drainage modifications, and storm sewers.**				
5.2.1	Construct drainage improvements to reduce or eliminate localized flooding, including retention and detention ponds.	Marshall County, Albertville, Arab, Boaz, Grant, Guntersville	Flooding	Both	Project

Chapter 7–Plan Maintenance Process

7.1 Federal Requirements for the Plan Maintenance Process
7.2 Summary of Plan Updates
7.3 Monitoring, Evaluating and Updating the Mitigation Plan
7.4 Incorporation of the Mitigation Plan into Other Planning Mechanisms
7.5 Continuing Public Participation in the Plan Maintenance Process
7.6 Forms to Assist in the Plan Maintenance Process

7.1 Federal Requirements for the Plan Maintenance Process

This chapter of the plan addresses the Plan Maintenance Process requirements of 44 CFR Sec. 201.6 (c) (4), as follows:

"Sec. 201.6 (c) *Plan content.* The plan shall include the following:
(4) A *plan maintenance process* that includes:

(i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.
(ii) A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.
(iii) Discussion on how the community will continue public participation in the plan maintenance process."

7.2 Summary of Plan Updates

The Plan Maintenance Chapter of the Multi-Hazard Mitigation Plan has no significant changes. The sections remain the same with the information edited to include changes to dates and website information. Forms have been added at the end of this chapter to aid in the plan evaluation process throughout the 5-year period and after emergency and disaster events.

7.3 Monitoring, Evaluating, and Updating the Mitigation Plan

7.3.1 Ongoing Monitoring of the Plan

The Hazard Mitigation Planning Committee (HMPC) should continually monitor the mitigation measures chosen for implementation to gauge their progress. At a minimum, annual status reports by the jurisdictions should be provided to the EMA Director the jurisdictions' HMPC representatives for review at the LEPC meeting in August and should include the following information:

- Mitigation measures that have been completed, including public involvement activities.
- Actions that have been undertaken to implement the scheduled mitigation measure, such as, obtaining funding, permits, approvals or other resources to begin implementation.

- Revisions to the priority, timeline, responsibility, or funding source of a measure and cause for such revisions, or additional information or analysis that has been developed that would modify the mitigation measure assignment as initially adopted in the plan.
- Measures that a jurisdiction no longer intends to implement and justification for cancellation.

If amendments to the plan are necessary due to special opportunities for funding or response to a natural, human-caused, or technological disaster, the HMPC will oversee and approve all amendments to the plan by majority vote of a quorum of HMPC members. The ongoing review process may require adjustments to the selection of mitigation measures, priorities, timelines, lead responsibilities, and funding sources presented in the Community Mitigation Action Programs found in Volume II. Adjustments to the five-year plan should be noted to aid in the next update of the plan. A copy of the plan amendments will be submitted to all participating jurisdictions by the Marshall County EMA in a timely manner and filed with the Alabama EMA in order to assist with their mitigation strategies.

7.3.2 Evaluating the Plan

Annual evaluations of progress towards the implementation of the Mitigation Strategy will be overseen by the EMA director and conducted by the HMPC and should include an analysis of the status reports from the jurisdictions. Any discussions and reports by the HMPC should be documented and the findings should be clearly stated in the next revision. In its annual review during the August LEPC meeting, the HMPC should discuss the following topics to determine the effectiveness of the implementation actions and the need for revisions to the Mitigation Strategy:

- Are there any new potential hazards that have developed and were not addressed in this plan?
- Have any disasters occurred that are not included in this plan?
- Are there additional mitigation ideas that need to be incorporated into this plan?
- What projects or other measures have been initiated, completed, deferred, or deleted?
- Are there any changes in local capabilities to carry out mitigation measures?
- Have funding levels to support mitigation actions either increased or decreased?

Following disaster or emergency events that significantly impact all or a portion of Marshall County, the HMPC will have 60 days to evaluate the responsiveness of the Mitigation Strategy to the event and also any changes that should be made to the contents of the Risk Assessment. The Risk Assessment should evaluate the direct and indirect damages, response, and recovery costs (economic impacts) and the location, type, and extents of the damages. The results of the assessment should determine if existing mitigation capabilities should be strengthened and if any new mitigation initiatives should be incorporated into this plan to avoid similar losses from future hazard events. The results of the assessment should determine if new mitigation strategies should be pursued to lessen the impacts of future events. These findings will be provided to the affected jurisdictions for review and will be used during the next five-year update period.

Also, at times of disaster, mitigation measures that qualify for disaster funding should be carefully reviewed and application for funds should be considered. The opportunity to work with the public on hazard awareness is strongest after a disaster and so the committee should make every effort to strengthen the community's knowledge and preparedness for the next event once the community has addressed the immediate needs of those impacted by the event.

The HMPC may create subcommittees to oversee and evaluate plan implementation. This will be done at the Committee's discretion. An evaluation form, adapted from FEMA's Local Mitigation Planning Handbook, 2013, is included at the end of this chapter for use during the plan evaluations and a form to evaluate mitigation strategies during emergency and disaster events is also included.

7.3.3 Plan Update Process

Updates to the hazard mitigation plan may occur due to changes in federal requirements for review and update of the plan; significant natural, human-caused, or technological hazard event(s) before the expiration of the five-year plan update; or the requirement for a five-year update.

When an update occurs, due to any of the above stated reasons, the Marshall County EMA will publish a public notice that an update is being initiated and provide information on meeting schedules, how and where to get information on the plan, how to provide comments on the plan, and opportunities for other public involvement activities. The EMA will reconvene the HMPC who will carry out the steps necessary to update the plan.

For a significant event that occurs prior to the next five-year update, the HMPC will convene, under the guidance of the EMA director, within 60 days of the event to discuss the potential need for any amendments to the plan. If there are no significant disasters that trigger an update, the HMPC will be reconvened in time for the five-year update.

Nine to twelve months before the expiration of the current plan, the EMA Director will begin the initial steps for the five-year update to this plan. An additional year may be required in order to include time for planning grant applications and award.

Once the Hazard Mitigation Planning Committee has been reconvened, the following steps will occur:

Step 1. Review of the most recent FEMA local mitigation planning requirements and guidance.

Step 2. Evaluation of the existing planning process and recommendations for improvements.

Step 3. Examination and revision of the risk assessment, including hazard identification, profiles, vulnerabilities, and impacts on development trends, to ensure accuracy and up to date information.

Step 4. Update of mitigation strategies, goals, and action items, in large part based on the annual plan implementation evaluation input and suggestions by the HMPC.

Step 5. Evaluation of existing plan maintenance procedures and recommendations for improvements.

Step 6. Compliance with all applicable Federal regulations and directives.

Ninety days prior to the plan's expiration date, the EMA director will submit a final draft of the revised plan to the Alabama EMA for review and comments and then to FEMA for conditional approval. Once FEMA Region IV has issued a conditional approval, the EMA director will oversee the adoption of the updated plan by all participating jurisdictions.

7.4 Incorporation of the Mitigation Plan into Other Planning Mechanisms

The Marshall County Emergency Management Agency incorporates this update into their recent edition of the Marshall County Emergency Operations Plan. The implementation of the individual Community Mitigation Action Programs is the responsibility of each jurisdiction and governmental entity based on priorities, funding availability, capabilities, and other considerations described in Chapter 6 "Mitigation Strategy." The 2020 Marshall County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan, and as such, the mitigation measures vary according to each jurisdiction's needs and capabilities.

Mitigation should be a part of the planning mechanisms for all jurisdictions in Marshall County. This mitigation plan should be integrated into existing local plans, regulatory tools, and related programs in order to influence each jurisdiction's planning decisions concerning land use, development, public facilities, and infrastructure. Any updates, revisions, or amendments to the Marshall County Emergency Operations Plan, local comprehensive plans, capital improvement budgets or plans, zoning ordinances and maps, subdivision regulations, building and technical codes, and related development controls should be consistent with the goals, objectives, and mitigation measures adopted in this plan. During the plan update process, planning documents were reviewed to ensure mitigation measures can be fulfilled with the aid of their regulatory and planning tools. Each jurisdiction's commitment to this consistency is reflected in its respective mitigation action program. As part of the subsequent five-year update process, all local planning mechanisms should again be reviewed for effectiveness, and recommendations for new integration opportunities should be carefully considered.

The greatest strength to combat disasters is through knowledge, and the integration of educational materials and training are an important part of hazard mitigation. Ongoing public education programs should stress the importance of managing and mitigating hazard risks. Public information handouts and brochures for emergency preparedness should emphasize hazard mitigation options, where appropriate. Advantage should be taken of opportunities to participate in educating the public at community events and through workshops.

The Marshall County emergency operations planning programs and associated public emergency management activities must incorporate hazard mitigation planning to demonstrate the jurisdictions' and EMA's commitment to hazard mitigation.

7.5 Continuing Public Participation in the Plan Maintenance Process

Ongoing public participation is a critical part of maintaining an effective and relevant multi-hazard mitigation plan. In order for the plan to succeed, the public must support the mitigation efforts and provide public pressure to get mitigation measures implemented when necessary. The Hazard Mitigation Planning Committee desires involvement of its citizens in the mitigation planning process through participation in discussions and providing feedback and comments on the plan throughout the five-year implementation cycle and interim reviews.

Copies of this 2020 Marshall County Multi-Hazard Mitigation Plan are maintained at the Marshall County EMA office in Guntersville and at the principal offices of all of the jurisdictions that participated in the planning process. The Marshall County EMA website at http://www.marshallcoema.org contains a link to download an on-line copy of the plan. Many of the jurisdictions have links to the plan as does the Alabama Emergency Management Agency. Public comments can be mailed, e-mailed, or called into the Marshall County EMA.

When the HMPC makes significant modifications to the plan, meetings will be held. At these meetings, the public will be able to express their concerns, ideas, and opinions. At a minimum, public hearings will be held during the annual review, the five-year plan updates, and when amendments to the plan or the update is up for adoption. Public opinion surveys and public involvement activities required for the five-year update will be conducted and may be periodically administered by the Marshall County EMA.

Appendix H "Community Involvement Documentation" documents the public involvement activities initiated during the 2020 planning process. Some of these activities will continue throughout the five-year implementation cycle and be evaluated for effectiveness annually by the Hazard Mitigation Planning Committee. The public outreach and education programs in the mitigation strategies section of this plan commit each jurisdiction to informing the public about mitigation measures which should aid in a better prepared population. The constant monitoring of these programmed mitigation actions assures ongoing public participation throughout the plan maintenance process.

7.6 Forms to Assist in the Plan Maintenance Process

The following forms can be used during the plan maintenance process. The progress report form is adapted from FEMA's Local Mitigation Planning Handbook, 2013.

Marshall County Mitigation Action Progress Report Form

Plan Year		
Progress Report Period	From Date:	To Date:
Action/Project Title		
Responsible Agency		
Contact Name		
Contact Phone/Email		
Project Status	§ Project completed § Project canceled § Project on schedule § Anticipated completion date:_____ § Project delayed Explain _____	

Summary of Mitigation Action Progress for this Report Period

1. What was accomplished for this action/project during this reporting period?

   _____

   _____

2. What obstacles, problems, or delays did the action/project encounter?

   _____

   _____

3. If not completed, is the action/project still relevant? Should the action/project be changed or revised?

   _____

   _____

4. Other comments

   _____

   _____

Plan Section	Considerations	Explanation
Planning Process	Should new jurisdictions and/or districts be invited to participate in future plan updates?	
	Have any internal or external agencies been invaluable to the mitigation strategy?	
	Can any procedures (e.g., meeting announcements, plan updates) be done differently or more efficiently?	
	Has the Planning Team undertaken any public outreach activities?	
	How can public participation be improved?	
	Have there been any changes in public support and/or decision- maker priorities related to hazard mitigation?	
Capability Assessment	Have jurisdictions adopted new policies, plans, regulations, or reports that could be incorporated into this plan?	
	Are there different or additional administrative, human, technical, and financial resources available for mitigation planning?	
	Are there different or new education and outreach programs and resources available for mitigation activities?	
	Has NFIP participation changed in the participating jurisdictions?	

Plan Section	Considerations	Explanation
Risk Assessment	Has a natural and/or technical or human-caused disaster occurred?	
	Should the list of hazards addressed in the plan be modified?	
	Are there new data sources and/or additional maps and studies available? If so, what are they and what have they revealed? Should the information be incorporated into future plan updates?	
	Do any new critical facilities or infrastructure need to be added to the asset lists?	
	Have any changes in development trends occurred that could create additional risks?	
	Are there repetitive losses and/or severe repetitive losses to document?	
Mitigation Strategy	Is the mitigation strategy being implemented as anticipated? Were the cost and timeline estimates accurate?	
	Should new mitigation actions be added to the Action Plan? Should existing mitigation actions be revised or eliminated from the plan?	
	Are there new obstacles that were not anticipated in the plan that will need to be considered in the next plan update?	
	Are there new funding sources to consider?	
	Have elements of the plan been incorporated into other planning mechanisms?	

Plan Section	Considerations	Explanation
Plan Maintenance Procedures	Was the plan monitored and evaluated as anticipated?	
	What are needed improvements to the procedures?	

Adapted from FEMA's Local Mitigation Planning Handbook, 2013.

Marshall County Hazard Event Mitigation Action Report Form

Plan	2020 Marshall County Multi-Hazard Mitigation Plan
Type of Event	
Date of Event	
Days of Impact	
Responsible Agency	
Contact Name	
Contact Phone/Email	

Summary of Hazard Event

1. Area Impacted

   _____

   _____

2. Direct damages

   _____

   _____

3. Indirect damages

   _____

   _____

4. Response Costs (Economic)

   _____

   _____

5. Recovery Costs (Economic)

   _____

   _____

6. Should any new mitigation initiatives be incorporated into the plan to avoid similar losses from future events? If you have suggestions of measures that can be taken, please provide them below.

_____

_____

7. Any additional information.

_____

_____

_____

_____

Thank you for your information.

Appendix A
Federal Requirements for Local Mitigation Plans

App. A – Federal Requirements for Local Mitigation Plans

1.0 Compliance
2.0 44 CFR Sec. 201.6 (2013)

1.0 Compliance

The 2020 Marshall County Multi-Hazard Mitigation Plan addresses the Local Mitigation Plans requirements of 44 CFR Sec. 201.6.

2.0 44 CFR Sec. 201.6 (2013)

Section 201.6 Local Mitigation Plans - The local mitigation plan is the representation of the jurisdiction's commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. Local plans will also serve as the basis for the State to provide technical assistance and to prioritize project funding.

(a) *Plan requirements.*

(1) A local government must have a mitigation plan approved pursuant to this section in order to receive HMGP project grants. The Administrator may, at his discretion, require a local mitigation plan for the Repetitive Flood Claims Program. A local government must have a mitigation plan approved pursuant to this section in order to apply for and receive mitigation project grants under all other mitigation grant programs.

(2) Plans prepared for the FMA program, described at part 79 of this chapter, need only address these requirements as they relate to flood hazards in order to be eligible for FMA project grants. However, these plans must be clearly identified as being flood mitigation plans, and they will not meet the eligibility criteria for other mitigation grant programs, unless flooding is the only natural hazard the jurisdiction faces.

(3) Regional Directors may grant an exception to the plan requirement in extraordinary circumstances, such as in a small and impoverished community, when justification is provided. In these cases, a plan will be completed within 12 months of the award of the project grant. If a plan is not provided within this timeframe, the project grant will be terminated, and any costs incurred after notice of the grant's termination will not be reimbursed by FEMA.

(4) Multi-jurisdictional plans (*e.g.* watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan. State-wide plans will not be accepted as multi-jurisdictional plans.

(b) *Planning process.* An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

(c) *Plan content.* The plan shall include the following:

(1) Documentation of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

(2) A *risk* assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment shall include:

(i) A description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

(ii) A description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:

A. The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;

B. An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate;

C. Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

(iii) For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

(3) A *mitigation strategy* that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section shall include:

(i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

(ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

(iii) An action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

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

(4) A plan maintenance process *that includes:*

(i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

(ii) A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

(iii) Discussion on how the community will continue public participation in the plan maintenance process.

(5) *Documentation* that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

(d) *Plan review.*

(1) Plans must be submitted to the State Hazard Mitigation Officer (SHMO) for initial review and coordination. The State will then send the plan to the appropriate FEMA Regional Office for formal review and approval. Where the State point of contact for the FMA program is different from the SHMO, the SHMO will be responsible for coordinating the local plan reviews between the FMA point of contact and FEMA.

(2) The Regional review will be completed within 45 days after receipt from the State, whenever possible.

(3) A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

(4) Managing States that have been approved under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c) will be delegated approval authority for local mitigation plans, and the review will be based on the criteria in this part. Managing States will review the plans within 45 days of receipt of the plans, whenever possible, and provide a copy of the approved plans to the Regional Office. [67 FR 8848, Feb. 26, 2002, as amended at 67 FR 61515, Oct. 1, 2002; 68 FR 61370, Oct. 28, 2003; 69 FR 55096, Sept. 13, 2004; 72 FR 61748, Oct. 31, 2007; 74 FR 47482, Sept. 16, 2009]

Appendix B
Community Mitigation Capabilities

App. B - Community Mitigation Capabilities

1.0 Scope and Methodology
2.0 Summary of Results
3.0 Planning and Regulatory Tools
4.0 GIS Resources
5.0 Administrative and Technical Resources
6.0 Fiscal Resources
7.0 Education and Awareness Programs
8.0 Insurance Services Office (ISO) Ratings

1.0 Scope and Methodology

The ability to lessen the risk of hazards through the implementation of mitigation strategies is dependent on a jurisdiction's capabilities, either in-house or through arrangements with outside sources. To determine if a jurisdiction could enact a measure, the plan update process looked at each jurisdiction's capabilities. Through the knowledge of each community's capabilities, a tailored community action plan was developed for each jurisdiction.

Marshall County is a suburban/rural county with no major cities. The largest city is Albertville with a population of approximately 22,000, and the smallest is Union Grove with 79. Marshall County does not have home-rule, so they have limited regulatory ability. Also, as can be seen in the data presented in the plan, the county is mainly residential which provides for a lower tax base than counties with major industrial and commercial centers. Due to this statistic, many mitigation measures that counties with home-rule or a larger tax base can achieve are not applicable to Marshall County.

The community mitigation capabilities assessment examines the six components that the jurisdictions and agencies rely on in order to fulfill the goals and objectives of this plan. They are as follows: (1) planning and regulatory tools, (2) GIS resources, (3) administrative and technical resources, (4) fiscal resources, (5) public education and awareness programs, and (6) ISO ratings.

A questionnaire was provided to the HMPC members during the kick-off meetings which inquired about the jurisdiction's capabilities. They were asked if their jurisdiction had the capability, either within the jurisdiction or through a contract with outside sources such as the Top of Alabama Regional Council on Governments (TARCOG) or a consultant. Due to the size of the jurisdictions, many of the jurisdictions utilize outside sources for needs such as engineering or grant writing. Also, if the county provided services to the other jurisdictions, the jurisdictions included that as a capability they provide. Without the ability to utilize outside services, a number of the mitigation measures would not be able to be considered.

The tables in this appendix break out the capabilities by jurisdiction as of 2020.

2.0 Summary of Results

Planning and Regulatory Capabilities

- ✓ All jurisdictions adopted the 2014 Marshall County hazard mitigation plan and have actively implemented action items from that plan over the last five years.
- ✓ Albertville, Arab, Douglas, Grant, and Guntersville have comprehensive plans. Marshall County, Boaz, and Union Grove have no comprehensive plans.
- ✓ Five of the municipal governments have zoning ordinances: Albertville, Arab, Boaz, Grant, and Guntersville.
- ✓ Marshall County, Douglas, Grant, and Union Grove do not enforce building codes within their jurisdictions.

GIS Technical Capabilities

- ✓ All the jurisdictions in Marshall County have access to Geographic Information System (GIS) services, provided by the Marshall County Information Technology Department and the Top of Alabama Regional Council of Governments.
- ✓ Marshall County and Boaz maintain their own GIS system.
- ✓ Marshall County develops and maintains critical geographic data that supports hazard mitigation planning and analysis for all jurisdictions.

Staffing and Administrative Capabilities

- ✓ Albertville, Arab, Boaz and Guntersville have building code inspectors on staff.
- ✓ No community that participates in the NFIP has a full-time flood plain administrator, but personnel have been designated to administer the flood plain management ordinance. Those communities are Albertville, Arab, Boaz, Guntersville, and Marshall County.
- ✓ No local flood plain administrator is a Certified Floodplain Manager (CFM) designated by the Association of State Floodplain Managers (ASFM).
- ✓ None of the jurisdictions have a professional urban planner on staff.
- ✓ Marshall County has a professional engineer (P.E.) serving as County Engineer and Floodplain Manager serving in unincorporated areas only. Guntersville also has a P. E. on staff.

Fiscal Capabilities

- ✓ Marshall County, Arab, Boaz, Douglas, and Grant have been awarded FEMA mitigation grants while Guntersville received a mitigation grant under the State's Community Development Block Grant

(CDBG) Program.

- ✓ All the jurisdictions, with the exception of Albertville, have staff with grant writing experience or have retained a grant writer.

Education and Awareness Capabilities

- ✓ Most public outreach activities are conducted jointly through the Marshall County Emergency Management Agency and the Marshall County communities.

ISO Capabilities

- ✓ The Insurance Services Office (ISO) would not disclose BCGES (Building Code Effectiveness Grading Schedule) and PPC (Public Protection Classification) ratings directly to the planning team which had to rely entirely on local knowledge for this survey.
- ✓ Among the communities in Marshall County that participate in the National Flood Insurance Program (NFIP), none of the jurisdictions participate in the CRS Program.
- ✓ The City of Albertville boasts a Property Protection Classification (PPC) of 2, and the City of Arab has a very high rating of 4.
- ✓ The Cities of Boaz and Guntersville have the highest Building Code Grade Effective Schedule (BCGES) rating of 5, according to available survey results.

3.0 Planning and Regulatory Tools

This section is an inventory of planning and regulatory tools the jurisdictions within Marshall County have to facilitate in preventing or lessening the impact of hazards. Planning allows the jurisdictions to study areas of concern and determine how to address the findings of the studies. It also allows for the jurisdictions to plan growth to address inhibit future mitigation issues. Regulatory tools provide the ability to ensure the plans for future development are followed and they also aid in addressing problems that arise from hazards, such as addressing flooding through storm water management regulations.

The planning and regulatory tools in Table B-1 can be leveraged to assist in mitigating the effects of hazards. As mentioned previously, due to the size of the some of the jurisdictions and the lack of home-rule for Marshall County, the towns of Douglas and Union Grove, along with Marshall County have limited planning and regulatory tools.

Table B-1. Planning and Regulatory Tools

Planning and Regulatory Tools	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove	Unincorporated Marshall County
Comprehensive/Master Plan	Y	Y	Y	N	N	Y	N	N
Capital Improvements Plan	Y	Y	Y	N	Y	N	N	Y
Economic Development Plan	N	Y	N	N	Y	N	N	Y
Local Emergency Operations Plan	Y	Y	Y	Y	Y	N	N	Y
Continuity of Operations Plan	N	N	N	N	Y	N	N	N
Transportation Plan	N	N	Y	N	N	N	N	N
Stormwater Management Plan	N	Y	N	N	Y	Y	N	N
Community Wildfire Protection Plan	N	N	N	N	N	N	N	N
Other special plans		1	2					3
Building Code, Permitting, and Inspections								
Building Code	Y	Y	Y	N	N	Y	N	N
Site plan review requirements	Y	Y	Y	N	N	Y	N	N
Land Use Planning and Ordinances								
Zoning ordinance	Y	Y	Y	N	Y	Y	N	N
Subdivision ordinance	Y	Y	Y	N	Y	Y	N	Y
Floodplain ordinance	N	Y	Y	N	N	Y	N	Y
Natural hazard specific ordinance	N	N	N	N	N	N	N	N
Flood insurance rate maps	N	Y	Y	Y	N	N	N	Y
Acquisition of land for open space	N	Y	Y	N	Y	N	N	N
1- Strategic Plan								
2- Flood Damage Prevention Plan								
3- Disaster Recovery Plan								

4.0 GIS Resources

Geographic information systems (GIS) and database management resources play an important role in mitigation efforts. Through the use of GIS, records of hazards can be included in the database and areas of concern can be mapped. This information can then be used in studies, planning and maintenance programs.

Marshall County's municipalities have limited GIS staffing capabilities and limited computer hardware and software resources for GIS. In these jurisdictions, Marshall County is providing GIS technical assistance and maintains critical geographic data that supports hazard mitigation planning and analysis. Table B-2 summarizes the GIS resources available to Marshall County jurisdictions.

Table B-2. GIS Resources

GIS Resources	Albertville	Arab	Boaz	Guntersville	Douglas	Grant	Union Grove	Marshall County
Access to a GIS Program	Y	Y	Y	Y	Y	Y	Y	Y
Maintains its own GIS	N	N	Y	N	N	N	N	Y
GIS Inventory of Natural Hazard Areas[1]	Y	Y	Y	Y	Y	Y	Y	Y
GIS Inventory of Critical Facilities[1]	Y	Y	Y	Y	Y	Y	Y	Y

[1]Maintained by Marshall County Information Technology Department

5.0 Administrative and Technical Resources

In order to realize success with mitigation measures, the jurisdictions must have the administrative and technical resources to carry out the strategies. Staff must be available to oversee the planning and regulatory related measures and they must have the technical expertise to adequately fulfill the roles.

The staffing and administrative capabilities of Marshall County and its participating jurisdictions, along with the technical resources available, are shown on Table B-3.

Table B-3. Administrative and Technical Resources

Administrative & Technical Resources	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove	Unincorporated Marshall County
Planning Commission	Y	Y	Y	N	N	Y	N	N
Mitigation Planning Committee	N	Y	N	N	N	N	N	Y
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	Y	Y	Y	N	N	N	N
Mutual aid agreements	Y	Y	Y	Y	Y	N	Y	Y
Staff								
Chief Building Official	Y	Y	Y	N	N	Y	N	Y
Floodplain Administrator	Y	Y	Y	N	N	N	N	Y
Emergency Manager	N	Y	N	N	N	N	N	Y
Community Planner	N	Y	N	N	N	N	N	N
Civil Engineer	Y	Y	Y	N	N	N	N	Y
GIS Coordinator	N	Y	Y	N	N	N	N	Y
Other -		Y						

Administrative & Technical Resources	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove	Unincorporated Marshall County
Technical								
Warning Systems/Services	N	Y	Y	Y	Y	Y	Y	Y
Hazard data and information	N	Y	Y	Y	N	Y	N	Y
Grant writing	Y	Y	Y	Y	Y	Y	Y	Y
HAZUS analysis	N	N	N	N	N	N	N	N

6.0 Fiscal Resources

A major constraint to the completion of previous mitigation measures has been the lack of financial resources. As mentioned previously, Marshall County is a smaller, non-metropolitan county with a limited tax base. As such, the ability for local governments to undertake costly hazard mitigation projects and actions is limited. In Marshall County, most of the jurisdictions' utility services are provided by independent boards or companies and the jurisdictions do not have control over their operations. This survey gathered information on Marshall County's fiscal capabilities through the identification of locally available financial resources and the local government's ability to compete for available mitigation grant resources. Table B-4 summarizes these fiscal resources.

Table B-4. Fiscal Resources

Financial	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove	Unincorporated Marshall County
Funding Resource								
Capital improvements project funding	Y	Y	Y	Y	Y	Y	N	Y
Authority to levy taxes for specific purposes	Y	Y	Y	N	Y	Y	N	Y
Fees for water, sewer, gas, or electric services	N	N	N	N	N	Y	N	N
Impact fees for new development	N	Y	N	N	N	Y	N	Y
Storm water utility fee	N	N	N	N	N	Y	N	N
Incur debt through general obligation bonds and/or special tax bonds	Y	Y	Y	N	Y	Y	N	Y
Incur debt through private activities	Y		Y	N	Y	Y	N	Y
Community Development Block Grant	Y	Y	Y	Y	N	Y	Y	Y
State funding programs	Y	Y	Y	Y	Y	Y	Y	Y
Submitted applications for FEMA mitigation grants	N	Y	Y	Y	Y	Y	Y	Y
Awarded FEMA mitigation grants	N	Y	Y	Y	Y	Y	Y	Y
Initiated mitigation projects funded by other sources	N	N	N	Y	N	N	N	N

Financial	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove	Unincorporated Marshall County
Has staff or outside entity capable of writing grants	Y	Y	Y	Y	Y	Y	Y	Y

7.0 Education and Awareness Programs

While the use of planning and regulations along with proper staffing are important in realizing mitigation goals and objectives, education and awareness programs are vital, especially in preventing injury or loss of life from hazards. A well-trained staff will be in a better position to assist the citizens in mitigation of hazards and a better educated populous should lead to lower economic and personal impacts from disasters.

Marshall County EMA has a strong record of public awareness campaigns and they conduct numerous hazard related exercises with local and state agencies throughout the year. The EMA has very good relations with the media and they utilize it as much as possible. The local schools are willing to assist with the dissemination of information to the community through the students. Education and awareness are a low to no cost measure that can, at times, do more for a community than some other measures. They are rather easy to implement and have a very high probability of being achieved. The table below summarizes the education and awareness efforts of Marshall County jurisdictions. Most awareness activities are conducted jointly with the Marshall County EMA.

Table B-5. Education and Awareness Programs

Education and Awareness	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove	Unincorporated Marshall County
Program/Organization								
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access, and functional needs populations, etc.	Y	Y	N	N	N	Y	N	Y
Ongoing education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	N		Y	N	N	Y	N	Y
Natural disaster or safety related school programs	Y	Y	Y	N	N	Y	N	Y
StormReady certification	Through EMA							
Firewise Communities certification	N	N	N	N	N	N	N	N

Education and Awareness	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove	Unincorporated Marshall County
Public-private partnership initiatives addressing disaster-related issues	N	Y	N	Y	N	Y	Y	Y

8.0 Insurance Services Office (ISO) Ratings

Each local government was surveyed to determine ratings in the following Insurance Services Office (ISO) programs: Community Rating System (CRS) Program, Property Protection Classification (PPC), and Building Code Effectiveness Grading Schedule (BCEGS). These rating systems provide valuable indicators of how the communities are reducing their hazard vulnerabilities through effective flood plain management, building code enforcement, and fire protection.

The CRS is an incentive-based program that encourages NFIP communities to undertake enhanced program measures to reduce the impacts of flooding. The CRS achieves these goals by encouraging communities to implement comprehensive flood plain mitigation programs that exceed the minimal requirements of the National Flood Insurance Program (NFIP). Class Communities can be rewarded by reduced flood insurance premiums – a 5% reduction for each rating increase. The highest rating of 1 can reduce premiums by 45% and the CRS entry rating of 9 results in a 5% reduction. NFIP communities that do not participate are rated class 10 and receive no premium reduction benefit. Among the communities in Marshall County that participate in the National Flood Insurance Program (NFIP), none of the jurisdictions participate in the CRS Program.

For the Property Protection Classification (PPC), the ISO collects information on municipal fire-protection efforts in communities throughout the United States. In each community, ISO analyzes the relevant data using its Fire Suppression Rating Schedule (FSRS). A PPC rating from 1 to 10 is assigned to each community. Class 1 generally represents superior property fire protection, and Class 10 indicates that the area's fire-suppression program doesn't meet ISO's minimum criteria.

The Building Code Effectiveness Grading Schedule (BCEGS) assesses the building codes in effect in a particular community and how the community enforces them. A community's classification is based on administration of codes, review of building plans, and field inspections. The BCEGS program assigns each municipality a BCEGS grade of 1 (exemplary commitment to building-code enforcement) to 10 (no credit).

The ISO would not disclose BCGES and PPC ratings directly to the planning team which had to rely on local knowledge for this survey. The incomplete results of the ISO ratings survey are found on Table B-6.

Table B-6. Insurance Service Office (ISO) Ratings

Insurance Service Office (ISO) Ratings	Marshall County	Albertville	Arab	Boaz	Guntersville	Douglas	Grant	Union Grove
CRS Classification	10	10	10	10	10	NP	NP	NP
Property Protection Classification (PPC)	NR	2	4	3	5	5/9	6/9	NR
Building Code Effectiveness Grading Schedule (BCEGS)	NR	NR	6	5	5	NR	NA	NR

NP=Not Participating in the NFIP NR=No Response

Appendix C
2014 Plan Implementation Status

App. C – 2014 Plan Implementation Status

1.0 Scope and Methodology
2.0 Summary of Results

1.0 Scope and Methodology

A requirement when conducting a plan update is a thorough evaluation of the previous plan's mitigation measures. Through this process, the jurisdictions can gauge their progress in addressing the hazards that affect their area. They can determine what works, what does not, and can determine if the mitigation strategy should be continued or if a new course is warranted. Table C-1 included in this appendix shows the implementation status for the 2014 mitigation measures for each jurisdiction from the 2014 Marshall County Multi-Hazard Mitigation Plan.

The Hazard Mitigation Planning Committee (HMPC) members were provided with their community action programs from the 2014 plan and were instructed to indicate the status of their mitigation measures. The mitigation measures involved many different responsible parties so the HMPC members required an extended period of time to gather the information for this exercise. The representatives were instructed that if a measure was not completed, the respondent was to indicate why it was not completed. The suggested reasons for a lack of completion were that the measures were ongoing; there was a lack of funding; they had an administrative shortage; they had no legal authority; it was not technically feasible; or there was no political support for the measure. When creating the mitigation strategy for the next 5 years, the HMPC members referred to the responses from the implementation status exercise and adjusted their measures accordingly. Measures for which they had no legal authority were removed as were measures that did not apply to the jurisdiction. Some measures that were not enacted due to financial constraints or a lack of political support from the 2014 plan were retained because those variables could change over the course of the next five years.

The information in Table C-1 is what was provided in the implementation status report from each jurisdiction. Occasionally a respondent would reply using reasoning other than the 7 recommended responses. Some responded with N/A which meant that the measure is not applicable to the jurisdiction. "NO" implies that the measure was not completed but a reason was not provided.

2.0 Summary of Results

- ✓ The 2014 Marshall County Multi-Hazard Mitigation Plan contained approximately 84 mitigation measures. Thirty-three of these mitigation measures were applicable to all the participating jurisdictions.

- ✓ The level of attainment of the measures varied by jurisdiction. According to the responses from the HMPC members, Marshall County completed or has on-going measures of 25%, Albertville 44%, Arab 41%, Boaz 33%, Douglas 37%, Grant 35%, Guntersville 85%, and Union Grove 41%.

- ✓ A number of mitigation measures have been removed from the jurisdiction's individual community action programs for this update because the participants realized that such measures would not be addressed due to extenuating circumstances. For example, if a jurisdiction did not have the legal authority to carry out a measure it was removed from their 2020 community action program.

The Key for Table C-1 is as follows:

C = Completed

OG = On Going. This measure was completed and will continue in the 2020 Plan.

NLA = No Legal Authority

NTF = Not Technically Feasible

AS = Administrative Shortage

LOF = Lack of Funding

NPS = No Political Support

N/A= Not applicable

NO= Not completed, no reason provided

Table C-1. 2014 Marshall County Multi-Hazard Mitigation Plan Implementation Status Results

2014 Mitigation Measure		Marshall County	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove
1.1.1	Maintain up-to-date comprehensive plans for all jurisdictions. Each plan should address natural hazards exposure and include long-term disaster resistance measures. The vulnerability and environmental suitability of lands for future development should be clearly addressed. Local plans should assess the vulnerability of designated hazard areas and encourage open space planning to create amenities for recreation and conservation of fragile resources.		OG	OG	OG	N/A	N/A	OG	
1.1.2	Integrate the findings and recommendations of this plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.		OG	OG	OG			OG	
1.1.3	Prepare a five-year capital improvements plan (CIP) to include capital projects that implements the natural hazards element of the community's comprehensive plan or projects identified in the Community Mitigation Action Program of this multi-hazard mitigation plan.	LPS	OG	LOF	NO			OG	
1.2.1	Maintain a centralized, countywide natural hazards and risk assessment database in GIS that is accessible to local planners and emergency management personnel, including such data as, flood zones, geohazards, major drainages structures, dams/levees, tornado tracks, disaster events and their extents, and a comprehensive inventory of critical facilities within all jurisdictions.	OG							
1.2.2	Integrate FEMA HAZUS-MH applications for hazard loss estimations within local GIS programs. Maintain up-to-date data within GIS to apply the full loss estimation capabilities of HAZUS.	NO							
1.2.3	Mark depths of flooding and storm surge immediately after each event. Enter and maintain these historical records in GIS.	AS/NTF	AS	N/A	AS			OG	

2014 Mitigation Measure		Marshall County	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove
1.3.1	Carry out detailed planning and engineering studies for sub-basins in critical flood hazard areas to determine watershed-wide solutions to flooding.	AS/NTF	AS	N/A	AS			OG	
1.3.2	Identify existing culturally or socially significant structures and critical facilities within participating jurisdictions that have the most potential for losses from natural hazard events and identify needed structural upgrades.	NLA	OG	AS	AS			OG	
1.3.3	Evaluate elevation and culvert sizing of existing roadways in flash flood-prone areas to ensure compliance with current standards for design year floods and develop a program for construction upgrades as appropriate.	AS	OG	C	OG			OG	
1.3.4	Inventory and map existing fire hydrants throughout the county and identify areas in need of new fire hydrants.		C	C	LOF	OG		C	
1.3.5	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	OG	LOF	C	LOF			OG	
1.3.6	Develop an inventory of public and commercial building vulnerable to earthquake damage, focusing on pre 1940 construction and buildings with cripple wall foundations.	NLA	NTF	AS	NTF			NO	
1.4.2	Evaluate additional land use restrictions within designated flood zones, such as prohibition of storage of buoyant materials, storage of hazardous materials, and restrictive development of flood ways, among others.		OG	AS	NO			OG	
1.4.3	Require delineation of flood plain fringe, floodways, and wetlands on all plans submitted with a permit for development within a flood plain.		AS	AS	NO			OG	
1.4.4	Enact local ordinance that require community storm shelters within sizeable mobile home parks and subdivisions.		LOF	N/A	NO			NO	
1.5.1	Examine regulatory options and feasibility of requiring open space areas for recreation, landscaping, and drainage control.	NO	LOF	N/A	NO	NTF	N/A	OG	

2014 Mitigation Measure		Marshall County	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove
1.6.1	Train local flood plain managers through programs offered by the State Flood Plain Coordinator and FEMA's training center in Emmitsburg, Maryland.	NO	LOF	N/A	NO			OG	
1.6.2	Maintain a library of technical assistance and guidance materials to support the local floodplain manager.	OG	OG	N/A	C	N/A	N/A	OG	AS
1.6.3	Promote the adoption of uniform flood hazard prevention ordinance among all NFIP communities. The ordinance standards should encourage flood plain management that maintains the natural and beneficial functions of flood plains by maximizing the credits that could be obtained for "Higher Regulatory Standards" under the Community Rating System (CRS) Program.	NO	OG	N/A	NO	N/A	N/A	OG	AS
1.6.4	Maintain membership for locally designated flood plain managers in the Association of State Flood Plain Managers and the Alabama Association Flood Plain Managers and encourage active participation.	NO	AS	N/A	NO			OG	
1.6.5	Participate in the "Turn Around Don't Drown" program by purchasing and installing signs in known flash flood bridge overpass locations.	NO		N/A	NO	LOF	N/A	OG	OG
1.6.6	Improve flood risk assessment by documenting high water marks post event, verification of FEMA's repetitive loss inventory and revising and updating regulatory floodplain maps.	OG	AS	N/A	AS			OG	
1.7.1	Promote good construction practices and proper code enforcement to mitigate structural failures during natural hazard events.		OG	C	C			OG	
1.7.2	Evaluate and revise as appropriate, building codes for roof construction to maximize protection against wind damage from hurricanes, tornadoes, and windstorms; encourage installation of "hurricane clips."		OG	C	C			OG	
1.7.3	Relocate existing utility lines underground, where feasible and cost effective, and require, through local subdivision and land development regulations, the placement of all new utility lines underground for large residential subdivisions and commercial developments.	NLA/LPS	OG	C	NO			OG	

2014 Mitigation Measure		Marshall County	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove
1.7.4	Ensure fire safety ordinances properly regulate open burning, the use of liquid fuel and electric space heaters.		OG	C	C			OG	
1.7.5	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	NLA	OG	C	C			OG	
1.7.6	Require the construction of safe rooms within new public buildings, such as new schools, libraries, community centers, and other public buildings where feasible.	NLA	NLA	C	NO			OG	
1.8.1	Review and revise as necessary, landscaping standards for parking lots that reduce the size of impervious surfaces and encourage natural infiltration of rainwater.		OG	C	NO			OG	
1.8.2	Establish ordinances to help mitigate fire hazards related to fuel buildup due to recent hurricanes, by raising tree canopies close to homes, thinning forests near urban areas, and removing trees that are too close to homes.		NLA	N/A	N/A			OG	
1.8.3	Establish ordinance for the planting of new urban forests or replacement of hurricane damaged urban forests using hurricane resistant tree species to mitigate wind and erosion problems, help beautify and promote healthy urban environments and reduce heating, cooling and storm runoff costs.	NLA	NTF	N/A	N/A			OG	
1.9.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	NTF	OG	C	NO		N/A	OG	
1.9.2	Develop, adopt, and implement subdivision regulations that require proper stormwater infrastructure design and construction.	OG	OG	C	OG		N/A	OG	
1.9.3	Establish urban forestry program to help mitigate storm water runoff common in areas with large impervious surfaces.	NLA	NTF	N/A	NO	NTF	N/A	OG	AS
1.10.1	Support legislation to establish a State dam safety program.	NO	OG	N/A	NO	OG	OG	OG	OG
1.11.1	Apply for/maintain membership in the CRS Program; continue to upgrade rating.	NO	OG	N/A	NO	AS	OG	OG	NTF

2014 Mitigation Measure		Marshall County	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove
1.12.1	Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards.	NLA	LOF	C	NO	NTF	OG	OG	OG
1.12.2	Conduct wildfire vulnerability assessments, including the vulnerability of critical facilities and number of residential properties in these risk areas, and prepare a comprehensive inventory to identify high and moderate wildfire risk areas.		OG	N/A	AS/NTF	OG	N/A	OG	
2.1.1	Relocate buildings out of hazardous flood areas, with emphasis on pre-FIRM residential buildings, where deemed more cost effective than property acquisition or building elevation.	LPS NTF	LOF	N/A	LOF	N/A	N/A	NO	NTF
2.2.1	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	NLA	LOF	N/A	LOF	N/A	N/A	OG	NTF
2.2.2	Utilize the most recent NFIP repetitive loss property list, and other appropriate sources, to create and maintain a prioritized list of acquisition mitigation projects based on claims paid.	NLA	AS	N/A	AS	N/A	N/A	OG	NTF
2.2.3	Acquire and relocate or demolish structures located in Landslide Hazard Areas and enforce permanent restrictions after land acquisition and structure removal.	NTF/NLA		N/A	LOF		N/A	OG	
2.3.1	Elevate certain buildings in flood prone areas where acquisition or relocation is not feasible, with emphasis on Pre-FIRM buildings; where feasible, elevation is preferable to flood proofing.	NLA	NLA	N/A	NO	N/A	N/A	OG	NTF
2.3.2	Repair, elevate and weatherize existing homes for low- to moderate-income families.	NLA	NLA	N/A	NO	N/A	N/A	NO	
2.4.1	Flood proof pre-FIRM non-residential buildings, where feasible.	NLA	LOF	N/A	LOF	N/A	N/A	OG	NTF
2.4.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	NLA	AS	N/A	AS	N/A	N/A	OG	N/A

2014 Mitigation Measure		Marshall County	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove
2.5.1	Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.	NLA	LOF	N/A	NO	NTF	C		NTF
2.5.2	Provide technical advisory assistance to building owners on available building retrofits to protect against natural hazards damages.	NTF/NLA	OG	C	LOF			OG	
2.6.1	Promote the purchase of insurance coverage by property owners and renters for flood damages in high-risk areas.	OG	NLA	N/A	NO	OG	N/A	OG	N/A
2.6.2	Promote the purchase of crop insurance to cover potential losses due to drought.	OG	NLA	N/A	NO	OG	N/A	OG	
2.7.1	Install lightning and/or surge protection on existing critical facilities.	NLA	LOF	C	NO	LOF	C	OG	LOF
2.7.2	Conduct ongoing tree trimming programs along power lines.	NLA	OG	C	N/A	N/A	N/A	OG	
2.8.1	Install backup power generators for critical facilities.	NLA	LOF	C	C	C	C	OG	LOF
3.1.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications and newspaper announcements.	OG	OG	N/A	NO	N/A	N/A	OG	N/A
3.2.1	Continue to participate in environmental awareness events to provide the public information on hazard exposure and mitigation measures, such as City/County Day, Hurricane Awareness Week, and Severe Weather Week.	OG	OG	C	C	OG	OG	OG	OG
3.2.2	Conduct materials distribution, via the internet and other media, and other outreach activities and workshops to encourage families and individuals to implement hazard mitigation measures in their homes.	OG	AS	C	C			OG	
3.2.3	Promote disaster resilience within the business community through workshops, educational materials, and planning guides, intended to assist business owners in recovering from a disaster event in a timely manner.	OG	OG	N/A	C			OG	
3.2.4	Distribute outreach materials to citizens, builders and business owners inquiring about a flood problem, a building permit or other natural hazard related questions.	NTF	OG	N/A	C			OG	

2014 Mitigation Measure		Marshall County	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove
3.2.5	Educate citizens on water saving techniques.	OG	OG	C	C	OG	N/A	NO	OG
3.2.6	Educate farmers on soil and water conservation practices.	OG	N/A	N/A	NO	OG	N/A	OG	
3.3.1	Arrange with the Multiple Listing Service (MLS) to require floodplain location disclosure as a condition for each real estate listing.	NO	NO	N/A	NO	N/A	N/A	NO	N/A
3.3.2	Consider the enactment of a local ordinance or state law to require floodplain location disclosure when a property is listed for sale.	NO	NLA	NO	NO			OG	
3.4.1	Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.	OG	AS	N/A	NO	OG	OG	OG	N/A
3.5.1	Distribute hazard mitigation brochures to students through area schools.	NTF	AS	NO	C	N/A	N/A	AS	N/A
3.5.2	Educate homeowners about structural and non-structural retrofitting of vulnerable homes.	OG	NTF	NO	N	OG	N/A	OG	OG
3.6.1	Distribute the 2014 plan to local officials, stakeholders, and interested individuals through internet download.	OG	AS	NO	C	OG	N	OG	OG
3.7.1	Provide technical assistance to homeowners, builders, and developers on flood protection alternatives.	NLA	OG	NO	AS			OG	
3.8.1	Maintain appropriate media relationships to ensure the public is informed of hazard threats and means to mitigate property damages and loss of life.		OG	C	C	OG	OG	OG	OG
3.9.1	Promote the use of weather radios in households and businesses.	OG	OG	C	C	OG	OG	OG	OG
3.9.2	Require the installation of weather radios in all public buildings and places of public assembly.	NO	NLA	NO	N	OG	OG	OG	OG
3.9.3	Distribute weather radios and emergency response instructions to municipal residents.	OG	LOF	C	N	LOF	OG	NTF	OG
3.10.1	Upgrade siren-warning systems to provide complete coverage to all jurisdictions.	OG							
3.10.2	Upgrade critical communications infrastructure.	NO	NO	C	C	LOF	N/A	OG	OG

2014 Mitigation Measure		Marshall County	Albertville	Arab	Boaz	Douglas	Grant	Guntersville	Union Grove
4.1.1	Increase open space acquisitions through the FEMA HMA Grant Programs and other flood plain acquisition efforts.	NO	LOF	N/A	AS	NTF	N/A	OG	NTF
4.2.1	Keep builders and developers informed of Federal wetlands permitting requirements of the Corps of Engineers.	NO	OG	N/A	AS			OG	
4.2.2	Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.	NLA	OG	C	C	NLA	OG	OG	N/A
4.3.1	Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).	NO	OG	C	C	N/A	N/A	OG	OG
4.3.2	Increase overall green spaces in cities by planting hurricane resistant trees with site and location taken into consideration.		LOF	C	N/A	NTF	OG	OG	OG
4.5.1	Enforce water use restrictions during periods of drought to conserve existing water supplies.	NLA	LOF	N/A	C	OG	OG	NLA	OG
5.1.1	Prepare and implement standard operating procedures and guidelines for drainage system maintenance.	NO	OG	C	OG	N/A	N/A	OG	LOF
5.2.1	Construct drainage improvements to reduce or eliminate localized flooding in identified problem drainage areas.	NO	OG	C	C	NTF	OG	OG	LOF
5.2.2	Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.	NLA		N/A	NLA	OG	N/A		OG
5.3.1	Construct new community safe rooms in accessible locations and add safe rooms within new and existing public and institutional buildings, such as schools, colleges and universities, senior centers, community centers, hospitals, and government buildings.	NO	LOF	OG	OG	N/A	C	NLA	
5.3.2	Establish a program for subsidizing individual and community safe room construction in appropriate locations and facilities.	LOF	LOF	C	N			OG	
5.3.3	Encourage the construction of safe rooms in new and existing homes and buildings.	OG	OG	C	C	OG	OG	OG	

Appendix D
Hazard Ratings and Descriptions

App. D - Hazard Ratings and Descriptions

1.0 Scope and Methodology
2.0 Summary of Results
3.0 Hazard Descriptions

This appendix provides the results of the hazard identification exercise from the kcik-off meetings for the update to the 2014 plan. Also included in this appendix are descriptions of the hazards that are covered in the plan.

1.0 Scope and Methodology

The HMPC Hazard Identification Exercises

The tables in this Appendix show the results of the Hazard Mitigation Planning Committee (HMPC) responses to hazard identification exercises presented at its January 23, 2020, committee meeting. These exercises serve as a resource to help identify the hazards that affect each jurisdiction. Also, through these exercises we can ascertain the probability and extent of each hazard and how the community impacts vary among Marshall County jurisdictions. These responses are those perceived by the HMPC membership, based on local knowledge and experience of the members, and are not necessarily supported by other resources evaluated in Chapter 5 – "Risk Assessment". The averages of the ratings compare how the location and impacts of hazards could vary among the jurisdictions. The same exercise was administered during the drafting of the 2014 plan and the rankings for the natural hazards assessment from 2014 are included in Table D-1 for comparison.

2.0 Summary of Results

Location of natural hazards

- ✓ The HMPC has identified the following hazards that could occur in all jurisdictions of Marshall County: tornadoes, severe storms, flash floods, winter storms, extreme cold, extreme heat, droughts, earthquakes, sinkholes , erosion, hail, and lightning.

- ✓ The remaining hazards are location specific and include: riverine floods, wildfires, dam/levee failures, and landslides.

- ✓ Two jurisdictions did not include hurricanes in their assessment which is most likely due to the fact that the initial hurricane does not cause the risk, it is the hazards that accompany or spin off from the hurricane which usually cause the risk.

Probability of natural hazards

- ✓ According to the HMPC, the natural hazards most likely to occur are tornadoes, severe storms, drought, extreme heat, extreme cold, lightning and winter storms .

- ✓ The natural hazards that have some likelihood of occurring are flash floods and hail.

- ✓ The natural hazards with the lowest probability of occurrence are wildfires, hurricanes, dam/levee failures, earthquakes, sinkholes, erosion, riverine floods, and landslides.

Extent of natural hazards

- ✓ The natural hazards deemed to have the greatest magnitude of damage are tornadoes, severe storms, and winter storms.

- ✓ Droughts, extreme heat, extreme cold, hail and lighting have the potential for moderate severity on average in Marshall County.

- ✓ Flash floods, wildfires, dam/levee failures, riverine flooding, hurricanes, earthquakes, sinkholes, and landslides are considered by the HMPC to have a potential severity of low to medium in extent.

Concern for human-caused and technological hazards

- ✓ While human-caused and technological hazards could occur in any location within all jurisdictions; the level of concern by the representatives for the jurisdictions varied.

- ✓ The human-caused and technological hazards that had the greatest amount of concern (moderate) were armed attack, cyberterrorism, industrial accident at a fixed location, industrial accident during transport, and a chemical spill. All jurisdictions were concerned with these hazards except Douglas. Douglas is not concerned about an industrial accident at a fixed location or a chemical spill.

- ✓ The remaining human-caused and technological hazards had a low amount of concern by all communities except Douglas, Marshall County and Albertville. Douglas was not concerned about any of the other human-caused and technological hazards. Albertville was concerned with controls systems failure, explosive blast, arson, and an intentional hazardous material release but not a nuclear, chemical, biological, radiological attack or agriterrorism. Marshall County was not concerned with biological or radiological attacks.

Impact of human-caused and technological hazards

- ✓ As with the level of concern by the HMPC members about the human-caused and technological hazards, the perceived level of impact varied depending on the respondent. Even if a jurisdiction registered that there was not a concern with a human-caused or technological hazard, they acknowledged that if one occurred there would be an impact; therefore, they provided feedback on the impact of the hazard event.

- ✓ The hazard with the highest impact rating was explosive blast.

- ✓ The hazards with a moderate level of impact were nuclear, chemical, biological, radiological attacks, arson, and an intentional hazardous material release. Also included under moderate impact are industrial accident at a fixed location, industrial accident during transport, and a chemical spill.

- ✓ The hazards deemed to have the least amount of impact were control systems failure and agriterrorism.

Concern for pandemics and infectious diseases

- ✓ Pandemics and infectious diseases can occur anywhere and affect most everyone. The level of severity is as varied as other natural hazards and are dependent on many variables which have been discussed in Chapter 5. The HMPC members recorded a low level of concern for pandemics and infectious diseases.

Impact of pandemics and infectious diseases

- ✓ The foreseen impact by pandemics and infectious diseases by the HMPC averaged as moderate impact.

It is interesting to note that the majority of the plan update process occurred in 2020 during the COVID-19 pandemic. The hazard risk assessment for the plan was done in late 2019, early 2020, prior to the COVID-19 outbreak. It is believed that if the representatives were asked to re-rank the hazards, concern and impact would rank at a high level for pandemics and infectious diseases.

Table Key.

The following describes the hazard ratings for Natural Hazards:

Location – 2014 -whether the jurisdiction is affected by the hazard 2020 - percent of the community impacted
2014-
1 = yes
0 = no
2020-
5-75-100% impacted
4- 50-75% impacted
3- 25-50% impacted
2- 10-25% impacted
1- Less than 10% impacted

Probability - the likelihood that the hazard would occur in this jurisdiction
5 - very high
4 - high
3 - medium
2 - low
1 - minimum or none
Extent - the severity or magnitude of the hazard should it occur in this jurisdiction
5 - very high
4 - high
3 - medium
2 - low
1 - minimum or none

The following describes the hazard ratings for Human-Caused, Technological and Pandemic and Infectious Disease Hazards:

Degree of Concern	
0 -	**None**: Do not think about it
1 -	**Low Level**: Consider it but do not believe it will happen
2 -	**Moderate Level**: Think about the possibility of it occurring and is concerned that it can happen
3 -	**High Level**: Very concerned about it happening
Impact	
0 -	**None**: No impact on the jurisdiction/agency
1 -	**Low Level**: Minor interruption to or effect on services
2 -	**Moderate Level**: Moderate interruption to or effect on services
3 -	**High Level**: Severe interruption to or effect on services

Table D-1. Marshall County HMPC Identification and Ratings of Natural Hazards

Hazard	Geographic Area	Location (2014)	Location (2020)	Probability (2014)	Probability (2020)	Extent (2014)	Extent (2020)
Tornadoes	Marshall County	1	4	5	2	5	3
	Albertville	1	4	4	3	5	3
	Arab	1	3	5	3	5	2
	Boaz	1	5	5	4	5	3
	Douglas	1	5	5	4	5	4
	Grant	1	5	5	2	5	3
	Guntersville	1	4	3	3	2	4
	Union Grove	-		-		-	
	AVERAGE	***1***	***4***	***5***	***3***	***5***	***3***
Severe Storms	Marshall County	1	4	-	3	5	3
	Albertville	1	4	4	2	5	2
	Arab	1	4	5	4	5	2
	Boaz	1	5	5	4	5	3
	Douglas	1	5	5	4	5	4
	Grant	1	4	5	3	5	3
	Guntersville	1	4	3	3	2	4
	Union Grove	-		-		-	
	AVERAGE	***1***	***4***	***5***	***3***	***5***	***3***
Flash Floods	Marshall County	1	3	3	4	3	2
	Albertville	0	1	1	1	1	1
	Arab	1	1	4	2	3	1
	Boaz	1	2	5	2	2	2
	Douglas	1	1	2	4	3	1
	Grant	1	1	3	1	2	1
	Guntersville	1	2	1	3	1	2
	Union Grove	-		-		-	
	AVERAGE	***0.9***	***2***	***3***	***2***	***2***	***1***
Riverine Floods (previous plans combined riverine and flash floods together)	Marshall County		2		4		2
	Albertville		0		1		1
	Arab		0		1		1
	Boaz		1		1		1
	Douglas		0		1		1
	Grant		1		1		1
	Guntersville		3		1		2
	Union Grove						
	AVERAGE		***1***		***1***		***1***

Hazard	Geographic Area	Location (2014)	Location (2020)	Probability (2014)	Probability (2020)	Extent (2014)	Extent (2020)
Winter Storms/Freezes	Marshall County	1	3	3	3	4	3
	Albertville	1	1	3	1	3	1
	Arab	1	4	3	2	5	1
	Boaz	1	4	5	2	5	2
	Douglas	1	5	3	4	4	2
	Grant	1	5	5	3	3	2
	Guntersville	1	4	3	3	3	2
	Union Grove	-		-		-	
	AVERAGE	***1***	***4***	***4***	***3***	***4***	***2***
Hurricanes	Marshall County	1	1	2	1	2	1
	Albertville	0	0	1	1	1	1
	Arab	1	1	2	1	2	1
	Boaz	1	1	1	1	1	1
	Douglas	1	0	2	1	3	1
	Grant	-	1	-	1	-	1
	Guntersville	1	1	2	1	2	1
	Union Grove	-		-		-	
	AVERAGE	***0.8***	***1***	***2***	***1***	***2***	***1***
Droughts/Heat Waves	Marshall County	1	4	3	3	3	1
	Albertville	1	2	3	2	3	2
	Arab	1	3	4	2	4	2
	Boaz	1	4	1	3	1	2
	Douglas	1	5	3	3	3	2
	Grant	1	5	3	4	3	4
	Guntersville	1	4	3	3	3	2
	Union Grove	-		-		-	
	AVERAGE	***1***	***4***	***3***	***3***	***3***	***2***
Wildfires	Marshall County	1	3	2	2	3	1
	Albertville	1	0	1	1	1	1
	Arab	1	1	2	1	2	1
	Boaz	1	3	1	1	1	2
	Douglas	1	1	3	1	3	2
	Grant	1	1	3	1	3	1
	Guntersville	1	4	2	1	2	2
	Union Grove	-		-		-	
	AVERAGE	***1***	***2***	***2***	***1***	***2***	***1***

Hazard	Geographic Area	Location (2014)	Location (2020)	Probability (2014)	Probability (2020)	Extent (2014)	Extent (2020)
Dam/Levee Failures	Marshall County	1	1	1	1	5	1
	Albertville	0	0	1	1	1	1
	Arab	1	0	2	1	4	1
	Boaz	1	1	0	1	0	1
	Douglas	1	0	2	1	2	1
	Grant	-	1	-	1	-	1
	Guntersville	1	3	1	1	1	3
	Union Grove	-		-		-	
	AVERAGE	***0.8***	***1***	***1***	***1***	***2***	***1***
Landslides	Marshall County	1	1	2	2	-	3
	Albertville	0	0	0	1	0	1
	Arab	0	0	0	1	0	1
	Boaz	1	1	1	1	1	1
	Douglas	1	0	0	1	0	1
	Grant	-	1	1	1	1	1
	Guntersville	1	1	1	1	1	1
	Union Grove	-		-		-	
	AVERAGE	***0.7***	***1***	***1***	***1***	***1***	***1***
Earthquakes	Marshall County	1	2	2	3	3	1
	Albertville	1	1	1	1	1	1
	Arab	1	1	1	1	1	1
	Boaz	1	4	1	1	1	3
	Douglas	1	5	2	1	2	1
	Grant	1	1	1	1	1	1
	Guntersville	1	4	2	2	1	1
	Union Grove	-		-		-	
	AVERAGE	***1***	***3***	***1***	***1***	***1***	***1***
Sinkholes	Marshall County	1	1	2	1	2	1
	Albertville	1	1	1	1	2	1
	Arab	1	1	2	1	2	1
	Boaz	1	1	1	1	2	1
	Douglas	1	2	2	1	2	1
	Grant	1	1	1	1	1	1
	Guntersville	1	1	1	1	1	2
	Union Grove	-		-		-	
	AVERAGE	***1***	***1***	***1***	***1***	***2***	***1***

Hazard	Geographic Area	Location (2014)	Location (2020)	Probability (2014)	Probability (2020)	Extent (2014)	Extent (2020)
Erosion	Marshall County		4		2		2
	Albertville		1		1		1
	Arab City Schools		1		1		1
	Boaz		2		2		1
	Douglas		1		1		1
	Town of Grant		1		1		1
	Guntersville		2		2		1
	Union Grove						
	AVERAGE		***2***		***1***		***1***
Extreme Cold	Marshall County		4		3		2
	Albertville		1		1		1
	Arab		3		2		2
	Boaz		5		3		2
	Douglas		5		3		2
	Grant		5		3		2
	Guntersville		4		2		1
	Union Grove						
	AVERAGE		***4***		***2***		***2***
Extreme Heat	Marshall County		4		3		1
	Albertville		1		1		1
	Arab		3		2		2
	Boaz		4		3		1
	Douglas		5		3		2
	Grant		5		4		4
	Guntersville		4		2		2
	Union Grove						
	AVERAGE		***4***		***3***		***2***
Hail	Marshall County		1		2		1
	Albertville		4		2		2
	Arab		3		2		2
	Boaz		5		3		2
	Douglas		5		2		2
	Grant		3		2		2
	Guntersville		3		3		2
	Union Grove						
	AVERAGE		***3***		***2***		***2***

Hazard	Geographic Area	Location (2014)	Location (2020)	Probability (2014)	Probability (2020)	Extent (2014)	Extent (2020)
Lightning	Marshall County		4		2		1
	Albertville		4		2		2
	Arab		4		4		2
	Boaz		5		3		2
	Douglas		5		4		4
	Grant		2		3		2
	Guntersville		4		3		3
	Union Grove						
	AVERAGE		***4***		***3***		***2***

Table D-2. Marshall County HMPC Identification and Ratings of Human Caused Hazards

Human Caused	Geographic Area	Degree of Concern	Impact
Nuclear Attack	Marshall County	1	1
	Albertville	0	0
	Arab	1	1
	Boaz	1	3
	Douglas	0	3
	Grant	1	2
	Guntersville	1	3
	Union Grove		
	AVERAGE	***1***	***2***
Explosive Blast	Marshall County	2	3
	Albertville	1	1
	Arab	1	3
	Boaz	2	3
	Douglas	0	3
	Grant	1	2
	Guntersville		
	Union Grove		
	AVERAGE	***1***	***3***
Chemical Attack	Marshall County	1	2
	Albertville	0	0
	Arab	1	1
	Boaz	2	3
	Douglas	0	3
	Grant	1	2
	Guntersville	2	2
	Union Grove		
	AVERAGE	***1***	***2***
Biological Attack	Marshall County	0	2
	Albertville	0	0
	Arab	1	1
	Boaz	1	3
	Douglas	0	3
	Grant	1	2
	Guntersville	1	3
	Union Grove		
	AVERAGE	***1***	***2***

Human Caused	Geographic Area	Degree of Concern	Impact
Radiological Attack	Marshall County	0	2
	Albertville	0	0
	Arab	1	1
	Boaz	1	3
	Douglas	0	3
	Grant	1	2
	Guntersville	1	2
	Union Grove		
	AVERAGE	***1***	***2***
Agriterrorism	Marshall County	1	1
	Albertville	0	0
	Arab	1	1
	Boaz	1	2
	Douglas	0	1
	Grant	1	2
	Guntersville	1	2
	Union Grove		
	AVERAGE	***1***	***1***
Armed Attack	Marshall County	2	2
	Albertville	2	2
	Arab	2	3
	Boaz	2	3
	Douglas	3	3
	Grant	1	2
	Guntersville	1	2
	Union Grove		
	AVERAGE	***2***	***2***
Cyber Terrorism	Marshall County	3	3
	Albertville	1	1
	Arab	2	3
	Boaz	3	2
	Douglas	2	3
	Grant	1	2
	Guntersville	2	2
	Union Grove		
	AVERAGE	***2***	***2***

Human Caused	Geographic Area	Degree of Concern	Impact
Arson/Incendiary Attack	Marshall County	2	2
	Albertville	1	1
	Arab	1	3
	Boaz	1	3
	Douglas	0	3
	Grant	1	2
	Guntersville	1	2
	Union Grove		
	AVERAGE	***1***	***2***
Hazardous Material Release (Intentional)	Marshall County	2	2
	Albertville	1	1
	Arab	1	1
	Boaz	1	2
	Douglas	0	3
	Grant	1	2
	Guntersville	1	3
	Union Grove		
	AVERAGE	***1***	***2***

Table D-3. Marshall County HMPC Identification and Ratings of Technological Hazards

Technological	Geographic Area	Degree of Concern	Impact
Industrial (Fixed)	Marshall County	3	2
	Albertville	2	2
	Arab	1	1
	Boaz	2	2
	Douglas	0	0
	Grant	1	2
	Guntersville	2	3
	Union Grove		
	AVERAGE	***2***	***2***
Industrial (Transp.)	Marshall County	3	2
	Albertville	2	2
	Arab	2	2
	Boaz	2	2
	Douglas	2	3
	Grant	2	2
	Guntersville	2	3
	Union Grove		
	AVERAGE	***2***	***2***
Controls Failure	Marshall County	1	2
	Albertville	1	1
	Arab	1	2
	Boaz	2	2
	Douglas	0	0
	Grant	1	2
	Guntersville	1	1
	Union Grove		
	AVERAGE	***1***	***1***
Chemical Spill	Marshall County	3	3
	Albertville	1	1
	Arab	1	1
	Boaz	2	3
	Douglas	0	3
	Grant	1	1
	Guntersville	1	3
	Union Grove		
	AVERAGE	***1***	***2***
	Albertville	2	2

Table D-4. Marshall County HMPC Identification and Ratings of Pandemics/Infectious Diseases

Pandemic/ Infectious Disease	Geographic Area	Degree of Concern	Impact
Disease/Pandemic	Marshall County	1	2
	Albertville	1	1
	Arab	2	2
	Boaz	2	3
	Douglas	2	3
	Grant	1	2
	Guntersville	1	3
	Union Grove		
	AVERAGE	***1***	***2***

3.0 Hazard Descriptions

Tornadoes Description

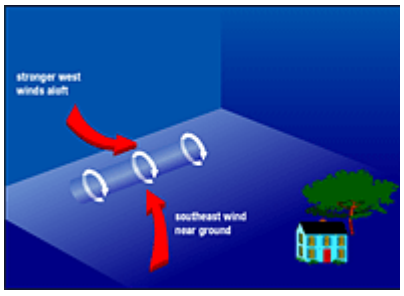
Tornadoes are one of nature's most violent storms, which are characterized by a rapidly rotating column of air extending from the base of a thunderstorm to the ground. In an average year, approximately 1,000 tornadoes are reported across the United States, resulting in over 1,500 injuries and 80 deaths, the greatest number of wind-related deaths. The most violent tornadoes, with wind speeds of 250 mph or more, are capable of tremendous destruction. Damage paths can be more than one mile wide and 50 miles long. Tornadoes can occur anywhere and come in all shapes and sizes.

In Alabama, peak tornado season is generally March through May with a secondary season in late fall; however, tornadoes can strike at any time of the year if the essential conditions are present. Tornadoes in the peak season are often associated with strong, frontal systems that form in central states and move east. Occasionally, large outbreaks of tornadoes occur with this type of weather pattern. Several states may be affected by numerous severe storms and tornadoes.

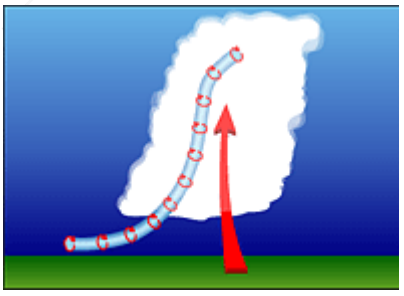
Tornadoes can occur in thunderstorms that develop in warm, moist air masses in advance of eastward-moving cold fronts. These thunderstorms often produce large hail and strong winds, in addition to tornadoes. Thunderstorms spawn tornadoes when cold air overrides a layer of warm air, causing the warm air to rise rapidly. Tornadoes occasionally accompany tropical storms and hurricanes that move over land. They are most common to the right and ahead of the path of the storm center as it comes onshore. The winds produced from wildfires have also been known to produce tornadoes.

The following graphic describes the formation of a tornado:

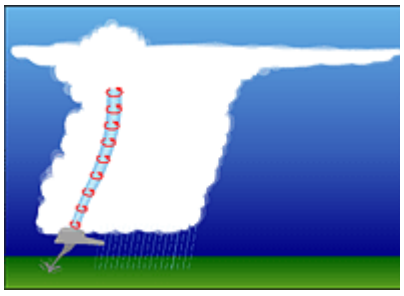
Figure D-1. How a Tornado Forms



▲Before thunderstorms develop, a change in wind direction and an increase in wind speed with increasing height create an invisible, horizontal spinning effect in the lower atmosphere.



▲Rising air within the thunderstorm updraft tilts the rotating air from horizontal to vertical.



▲An area of rotation, 2-6 miles wide, now extends through much of the storm. Most strong and violent tornadoes form within this area of strong rotation.



Woodward OK (Ron Przybylinski)

▲A lower cloud base in the center of the photograph identifies an area of rotation known as a rotating wall cloud. This area is often nearly rain-free. Note rain in the background.



Woodward OK (Ron Przybylinski)

▲Moments later a strong tornado develops in this area. Softball-size hail and damaging "straight-line" winds also occurred with this storm.

Source: Tornadoes – A Preparedness Guide, National Weather Service, February 1995.

Meteorologists rely on weather radar to provide information on developing storms. The National Weather Service is strategically locating Doppler radars across the country which can detect air movement toward or away from the radar. Early detection of increasing rotation aloft within a thunderstorm can allow life-saving warnings to be issued before the tornado forms.

When conditions are favorable for severe weather to develop, a severe thunderstorm or tornado WATCH is issued. Weather Service personnel use information from weather radar, spotters, and other sources to issue severe thunderstorm and tornado WARNINGS for areas where severe weather is imminent. Severe thunderstorm warnings are passed to local radio and television stations and are broadcast over local NOAA Weather Radio stations serving the warned areas. These warnings are also relayed to local emergency management and public safety officials who can activate local warning systems to alert communities.

In 1971, Dr. T. Theodore Fujita of the University of Chicago developed the original F-scale for wind damages, including tornadoes. The original F-scale, however, was recently replaced by an enhanced version effective February 1, 2007. The Enhanced F-scale is a more precise method of tornado damage assessment that classifies damage according to calibrations developed by engineers and meteorologists across 28 different types of damage indicators. The underlying premise is that a tornado scale needs to take into account the varying strengths and weaknesses of different types of construction. As with the original F-scale, the enhanced version rates the tornado as a whole based on most intense damage within the path. Historical tornadoes before February 1, 2007, will not be re-evaluated using the Enhanced F-scale.

Table D-3. Enhanced F Scale for Tornado Damage

FUJITA SCALE			DERIVED EF SCALE		OPERATIONAL EF SCALE	
F Number	**Fastest 1/4-mile (mph)**	**3 Second Gust (mph)**	**EF Number**	**3 Second Gust (mph)**	**EF Number**	**3 Second Gust (mph)**
0	40-72	45-78	0	65-85	0	65-85
1	73-112	79-117	1	86-109	1	86-110
2	113-157	118-161	2	110-137	2	111-135
3	158-207	162-209	3	138-167	3	136-165
4	208-260	210-261	4	168-199	4	166-200
5	261-318	262-317	5	200-234	5	Over 200

Source: NOAA Storm Prediction Center's On-Line Frequently Asked Questions about Tornadoes (http://www.spc.noaa.gov/faq/tornado/#f-scale3)

Table D-4. Fujita Tornado Damage Scale

SCALE	WIND ESTIMATE *** (MPH)	TYPICAL DAMAGE
F0	< 73	**Light damage.** Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112	**Moderate damage.** Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157	**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	**Severe damage.** Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.

SCALE	WIND ESTIMATE *** (MPH)	TYPICAL DAMAGE
F4	207-260	**Devastating damage.** Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F5	261-318	**Incredible damage.** Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds.); trees debarked; incredible phenomena will occur.

Source: NOAA Storm Prediction Center's On-Line Frequently Asked Questions about Tornadoes (http://www.spc.noaa.gov/faq/tornado/#f-scale3)

(The description of tornadoes presented in this section is based upon information extracted from the FEMA How to Guides Understanding Your Risks (FEMA 386-2), FEMA, August 2001, and Using HAZUS-MH for Risk Assessment (FEMA 433), FEMA, August 2004, Tornadoes – A Preparedness Guide, National Weather Service, February 1995, and the NOAA Storm Prediction Center's On-Line Frequently Asked Questions about Tornadoes (http://www.spc.noaa.gov/faq/tornado/#f-scale3).

Severe Storms Description

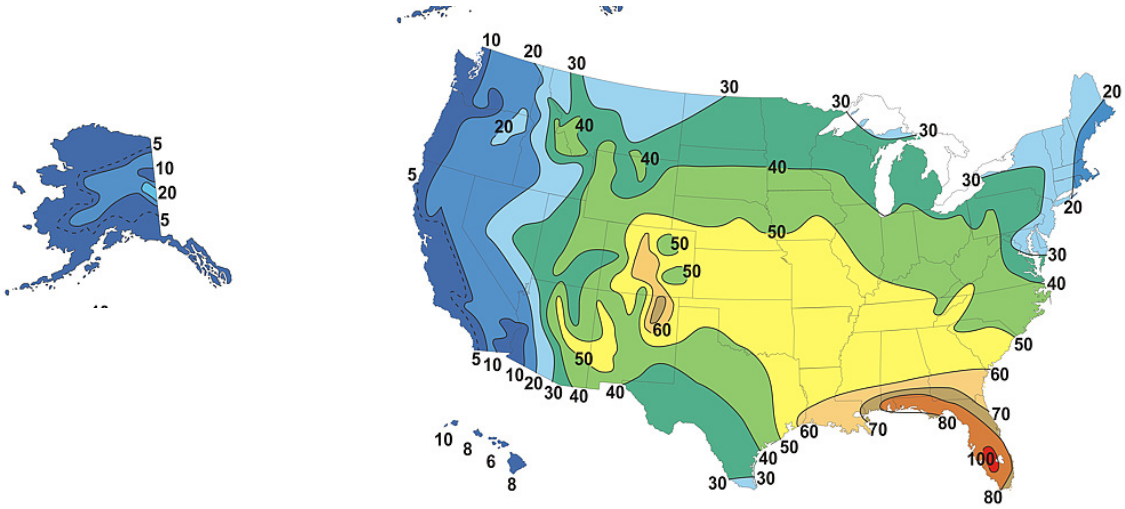
Severe storms, as referred to in this plan, include severe thunderstorms with damaging lightning, hail, and straight-line winds. Severe storms are also associated with tornadoes, hurricanes, and floods, which are described separately in this plan.

Severe storms affect relatively small areas when compared with hurricanes and winter storms. The typical thunderstorm is 15 miles in diameter and lasts an average of 30 minutes. Despite their small size, thunderstorms can be dangerous. Of the estimated 100,000 thunderstorms that occur each year in the United States, about 10 percent are classified as severe. The National Weather Service considers a thunderstorm severe if it produces hail at least 3/4-inch in diameter, winds of 58 mph or stronger, or a tornado.

Thunderstorms are formed by a combination of moisture to form clouds and rain, unstable air, that is, warm air that can rise rapidly, and lift from cold or warm fronts, sea breezes, mountains, or the sun's heat which are capable of lifting air.

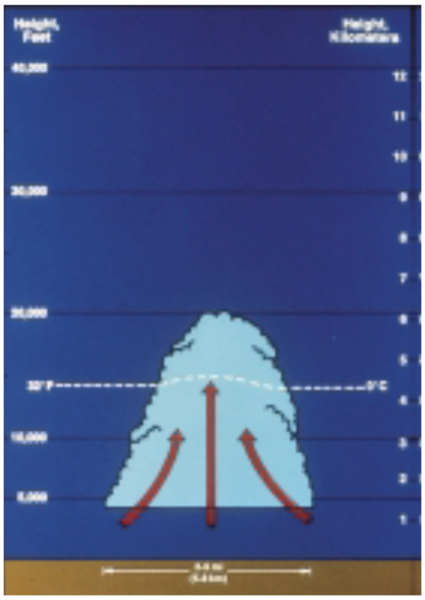
The National Weather Service estimates over 40,000 thunderstorms occur each day world-wide or close to 16 million annually. In the U.S., roughly 100,000 thunderstorms occur each year. The following map shows the average number of thunderstorm days each year throughout the U.S. The most frequent occurrence is in the southeastern states, with Florida having the highest incidence at 80 to 100+ thunderstorm days per year. Alabama's incidence is high at 50 to 80 thunderstorm days per year. Warm, moist air from the Gulf of Mexico and Atlantic Ocean is most readily available to fuel thunderstorm development in this region of the country.

Map D-1. U.S. Average Thunderstorm Days per Year



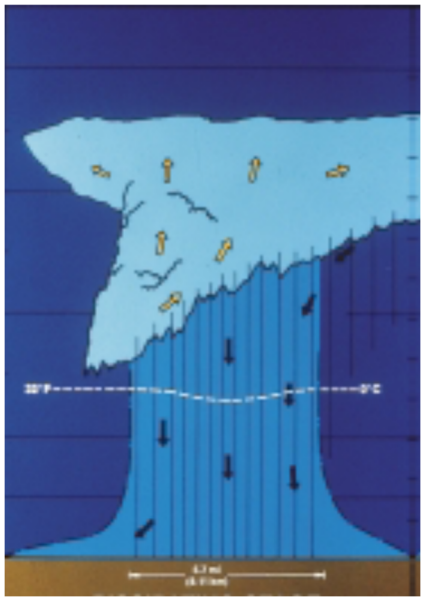
Source: National Weather Service

Figure D-2. Life Cycle of a Thunderstorm



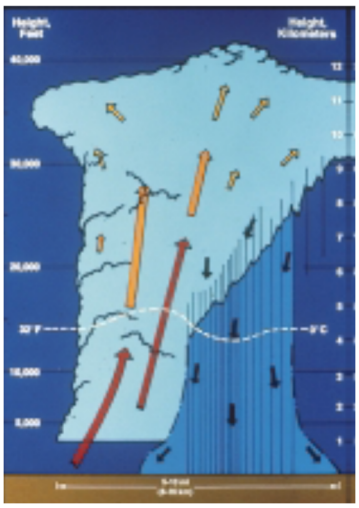
Developing Stage

- Towering cumulus cloud indicates rising air.
- Usually little if any rain during this stage.
- Lasts about 10 minutes.
- Occasional lightning.



Mature Stage

- Most likely time for hail, heavy rain, frequent lightning, strong winds, and tornadoes.
- Storm occasionally has a black or dark green appearance.
- Lasts an average of 10 to 20 minutes but may last much longer in some storms.



Source: National Weather Service

Dissipating Stage

- Rainfall decreases in intensity.
- Can still produce a burst of strong winds.
- Lightning remains a danger

Lightning results from the buildup and discharge of electrical energy between positively and negatively charged areas. Rising and descending air within a thunderstorm separates these positive and negative charges. Water and ice particles also affect charge distribution. A cloud-to-ground lightning strike begins as an invisible channel of electrically charged air moving from the cloud toward the ground. When one channel nears an object on the ground, a powerful surge of electricity from the ground moves upward to the clouds and produces the visible lightning strike.
Here are some facts about lightning from the National Weather Service:

- Lightning causes an average of 80 fatalities and 300 injuries each year.
- Lightning occurs in all thunderstorms.
- Each year lightning strikes the earth 20 million times. The energy from one lightning flash could light a 100-watt light bulb for more than three months.
- Most lightning fatalities and injuries occur when people are caught outdoors in the summer months during the afternoon and evening.
- Lightning can occur from cloud-to-cloud, within a cloud, cloud-to-ground, or cloud-to-air.
- Many fires in the western United States and Alaska are started by lightning.
- The air near a lightning strike is heated to 50,000°F--hotter than the surface of the sun!
- The rapid heating and cooling of the air near the lightning channel causes a shock wave resulting in thunder.

Most thunderstorm wind damage is caused by **straight-line winds**, which can exceed 100 mph. One type of straight-line wind, the downburst, is a small area of rapidly descending air beneath a thunderstorm. A downburst can cause damage equivalent to a strong tornado. Hail stones are large ice particles produced by intense thunderstorms. Strong rising currents of air within a storm, called updrafts, carry water droplets to a height where freezing occurs.



Figure D-3. Hail Stones

Another damaging effect of severe storms is **hail**. Hail stones are large ice particles that grow in size, becoming too heavy to be supported by the updraft, and fall to the ground. Large stones can fall at speeds faster than 100 mph. Hail causes substantial damage to property and crops each year in the U.S.

(The description of severe storms presented in this section is based upon information extracted from National Weather Service on-line publications at http://www.srh.noaa.gov/jetstream/tstorms/).

Floods Description

A flood is a natural event for rivers and streams. Excess water from snowmelt, rainfall, or storm surge accumulates and overflows onto the banks and adjacent floodplains. Floodplains are lowlands, adjacent to rivers, lakes, and oceans that are subject to recurring floods.

Hundreds of floods occur each year, making it one of the most common hazards in all 50 states and U.S. territories. Floods kill an average of 150 people a year nationwide. They can occur at any time of the year, in any part of the country, and at any time of day or night. Floodplains in the U.S. are home to over nine million households. Most injuries and deaths occur when people are swept away by flood currents, and most property damage results from inundation by sediment-filled water.

Several factors determine the severity of floods, including rainfall intensity (or other water source) and duration. A large amount of rainfall over a short time span can result in flash flood conditions. A small amount of rain can also result in floods in locations where the soil is saturated from a previous wet period or if the rain is concentrated in an area of impermeable surfaces such as large parking lots, paved roadways, or other impervious developed areas. Topography and ground cover are also contributing factors for floods. Water runoff is greater in areas with steep slopes and little or no vegetative ground cover. Frequency of inundation depends on the climate, soil, and channel slope. In regions where substantial precipitation occurs in a particular season each year, or in regions where annual flooding is derived principally from snowmelt, the floodplains may be inundated nearly every year. In regions without extended periods of below-freezing temperatures, floods usually occur in the season of highest precipitation. In areas where flooding is caused by melting snow, and occasionally compounded by rainfall, the flood season is spring or early summer.

Fortunately, most of the known floodplains in the United States have been mapped by FEMA, which administers the NFIP (National Flood Insurance Program). When a flood study is completed for the NFIP, the information and maps are assembled into a Flood Insurance Study (FIS). An FIS is a compilation and presentation of flood risk data for specific watercourses, lakes, and coastal flood hazard areas within a community and includes causes of flooding. The FIS report and associated maps delineate Special Flood Hazard Areas (SFHAs), designate flood risk zones, and establish base flood

elevations (BFEs), based on the flood that has a 1% chance of occurring annually, or the 100-year flood. Paper FIRMs and FIS reports are gradually being replaced by DFIRMs (digital FIRMs).

The **100-year flood** designation applies to the area that has a 1 percent chance, on average, of flooding in any given year. However, a 100-year flood could occur two years in a row, or once every 10 years. The 100-year flood is also referred to as the **base flood**. The base flood is the standard that has been adopted for the NFIP. It is a national standard that represents a compromise between minor floods and the greatest flood likely to occur in a given area and provides a useful benchmark.

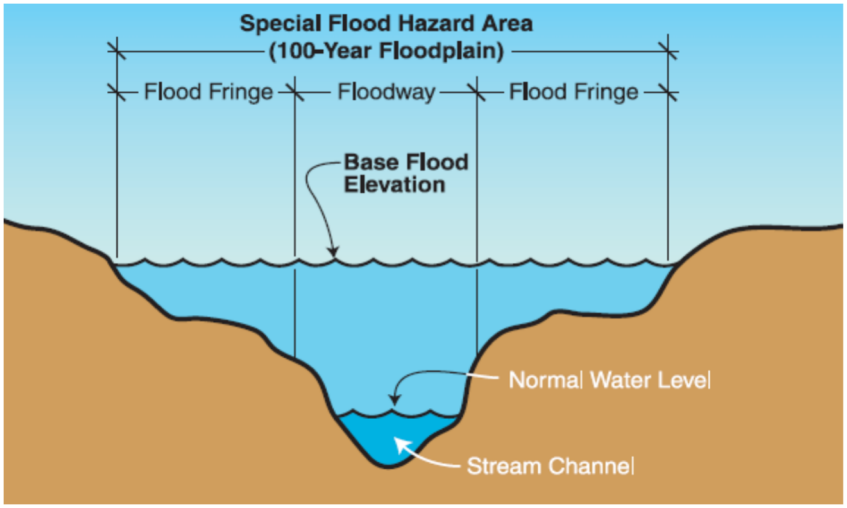
Base Flood Elevation (BFE), as shown on the FIRM, is the elevation of the water surface resulting from a flood that has a 1% chance of occurring in any given year. The BFE is the height of the base flood, usually in feet, in relation to the National Geodetic Vertical Datum (NGVD) of 1929, the North American Vertical Datum (NAVD) of 1988, or other datum referenced in the FIS report.

Special Flood Hazard Area (SFHA) is the shaded A-Zone or V-Zone area on a FIRM that identifies an area that has a 1% chance of being flooded in any given year or the **100-year floodplain**. FIRMs show different floodplains with different zone designations, as shown on Table 5-7 "Flood Zone Designations." These are used for insurance rating purposes, but are also necessary for flood permitting and flood hazard mitigation planning purposes. The **500-Year Floodplain** is the shaded X-Zone area shown on a FIRM that has a 0.2% chance of being flooded in any given year.

Floodway is the stream channel and that portion of the adjacent floodplain that must remain open to permit passage of the base flood without substantial increases in flood heights. The **Flood Fringe** is the remainder of the 100-year floodplain.

The following graphic shows the components of a floodplain along a stream:

Figure D-4. Flood Plain Cross Section



Source: FEMA

Table D-5. Flood Zone Designations

Flood Zones		
A Zones	100-year floodplain areas of high risk.	
	A	The base floodplain mapped by approximate methods. (i.e., BFEs are not determined). This is often called an unnumbered A zone or an approximate A zone.
	AE	The base floodplain where base flood elevations are provided.
	AO	The base floodplain with sheet flow, ponding, or shallow flooding. Base flood depths (feet above ground) are provided.
	AH	Shallow flooding base floodplain. BFEs are provided.
	A99	Area to be protected from base flood by levees or Federal flood protection systems under construction. BFEs are not determined.
	AR	The base floodplain that results from the de-certification of a previously accredited flood protection system that is in the process of being restored to provide a 100-year or greater level of flood protection.
V Zones	100-year coastal floodplain areas of high risk	
	V	The coastal area subject to a velocity hazard (wave action) where BFEs are not determined on the FIRM.
	VE	The coastal area subject to a velocity hazard (wave action) where BFEs are provided on the FIRM.
X Zones	Areas of minimal to moderate risk outside the 100-year floodplain.	
	Shaded	Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. Also includes areas protected by levees from the 100-year flood and shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
	Unshaded	Area of minimal flood hazard determined to be outside the 500-year floodplain.
D Zone	Area of undetermined but possible flood hazards.	

Source: FEMA

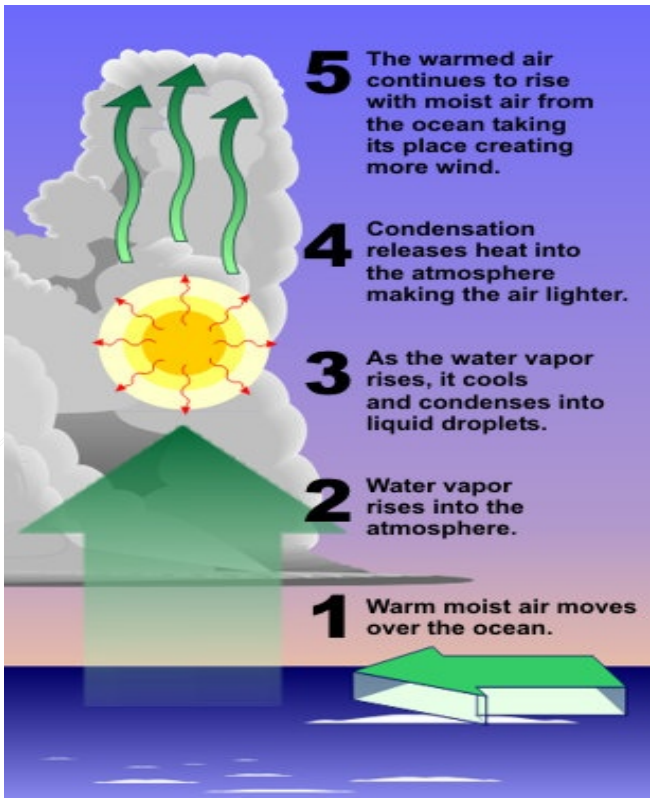
A range of floods, other than just the 100-year flood, could happen within an area. Buildings in very close proximity to a stream or shore line, for example, might experience flooding much more frequently.

(The description of floods presented in this section is based upon information extracted from the FEMA How to Guide Understanding Your Risks (FEMA 386-2), FEMA, August 2001).

Hurricanes Description

Hurricanes, as referred to in this plan, include all types of tropical cyclones: hurricanes, tropical storms, and tropical depressions. A **tropical cyclone** is a rotating weather system that develops in the tropics. A **tropical depression** is an organized system of persistent clouds and thunderstorms with low level closed circulation and maximum sustained winds of 38 mph or less. A **tropical storm** is an organized system of strong thunderstorms with a well-defined circulation and maximum sustained winds of 39 to 73 mph. All of these tropical cyclones begin as a disturbance. A disturbance may result from a number of different weather events including Easterly Waves, West African Disturbance Line, Tropical Upper Tropospheric Trough or an Old Frontal Boundary. In order for a tropical disturbance to develop into a hurricane, three things must occur. First, the disturbance must gather energy and heat through contact with warm ocean waters. Next, added moisture evaporated from the sea surface then provides power to the tropical storm. And last, the seedling storm forms a wind pattern near the ocean surface that spirals inward. Warm water is the most important of the three, as it provides the fuel for a disturbance to eventually develop into a hurricane. A **hurricane** is a tropical weather system with a well-defined circulation and sustained winds of 74 mph or higher. Even inland areas, well away from the coastline, can experience destructive winds, tornadoes and floods from tropical storms and hurricanes.

Figure D-5. How a Hurricane Forms



Source: National Hurricane Center (www.nhc.noaa.gov)

The Atlantic hurricane season begins on June 1 and lasts through November. Within the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico annually there are an average of 11 tropical storms, 6 of which become hurricanes. In a typical three-year span, the US coastline is struck an average five times, two that are major hurricanes (category 3 or higher.) Hurricanes pose the greatest threat to life and property, but tropical depressions and storms can also cause extensive damage and loss of life. Hurricanes are categorized on a scale of 1 to 5 based on their sustained wind speed. Herbert Saffir, a consulting engineer in Coral Gables, Florida, and Dr. Robert Simpson, then director of the National Hurricane Center, developed this scale in the 1970's. Category 3-5 hurricanes are considered to be major storms. The Saffir-Simpson scale is based primarily on wind speeds and includes estimates of barometric pressure and storm surge associated with each of the five categories.

Table D-6. Saffir-Simpson Scale

Category	Wind Speed	Storm Surge (feet above normal sea level)	Expected Damage
1	74-95 mph	4-5 ft.	**Minimal**: Damage is done primarily to shrubbery and trees, unanchored mobile homes are damage, some signs are damaged, no real damage is done to structures
2	96-110 mph	6-8 ft.	**Moderate**: Some trees are toppled, some roof coverings are damaged, major damage is done to mobile homes
3	111-130 mph	9-12 ft.	**Extensive**: Large trees are toppled, some structural damage is done to roofs, mobile homes are destroyed, and structural damage is done to small homes and utility buildings.
4	131-155 mph	13-18 ft.	**Extreme**: Extensive damage is done to roofs, windows, and doors; roof systems on small buildings completely fail, some curtain walls fail
5	>155 mph	>18 ft.	**Catastrophic**: Roof damage is considerable and widespread, window and door damage is severe, there are extensive glass failures and entire buildings could fail.

Source: National Hurricane Center

The main parts of a hurricane are the eye, the eye wall, and rain bands. The **eye** of a hurricane is the calmest part. The eye is typically 20-40 miles across and has light winds that don't exceed 15 mph. An eye will usually develop when the maximum sustained wind speed is more than 74mph. The strong rotation around the cyclone balances inflow to the center, causing air to ascend about 10-20 miles from the center forming the eyewall. A vacuum of air at the center is caused due to the strong rotation, the vacuum allows air flowing out of the top of the eyewall to turn inward and sink to replace the loss of air mass near the center. Due to the sinking air, cloud formation is suppressed. The passage of the eye is the calmest part of the hurricane. Since there is a light wind and fair weather, many

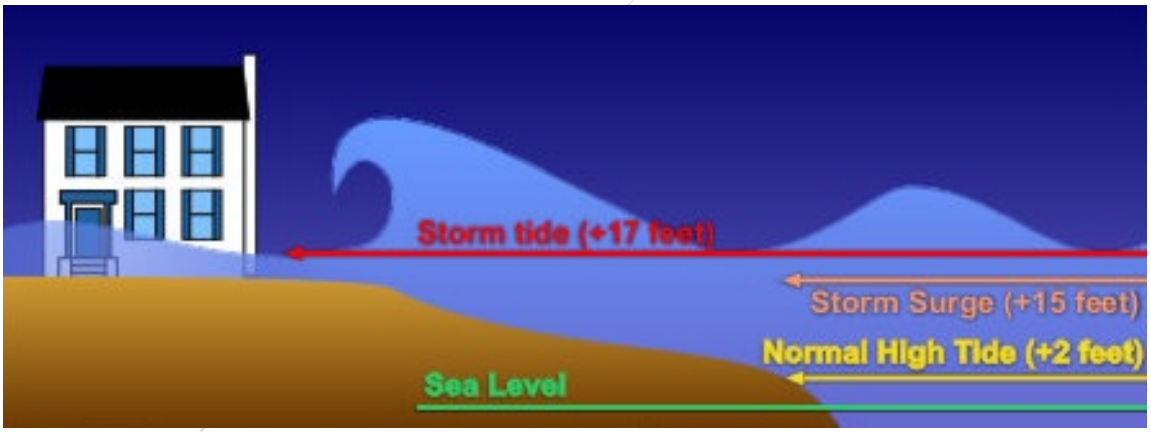
believe that the storm has passed, which can prove dangerous. Immediately after the passage of the eye, the eyewall winds return but in an opposite direction.

The **eyewall** is the part of a hurricane where the strong winds meet the eye. The eyewall is a group of tall thunderstorms that produce heavy rain and the strongest winds within the storm. Changes in the structure of the eye and eyewall can cause changes in the wind speed, which is an indicator of the storm's intensity. An eye may grow or shrink in size and additional eyewalls can form.

The **rain bands** are the outermost part of the hurricane. They are bands of clouds and thunderstorms that trail away from the eyewall in a spiral fashion. These bands produce heavy rain and strong winds, as well as tornadoes.

A hurricane also has additional hazards associated with it, both direct and indirect. The secondary hazards include storm surge, wind gusts, squalls, inland flooding and tornadoes. **Storm surge** is water that is pushed toward the shore by the winds around the storm. Storm surge combines with the normal tides to create the hurricane storm tide. Wind driven waves also combine into hurricane storm tide. The rise in water level can cause severe flooding in coastal areas. The level of surge is dependent upon the slope of the continental shelf. A shallow slope off of the coast allows a higher surge to inundate the area.

Figure D-6. Storm Surge



Source: NWS Jet Stream- Online School for Weather at
www.srh.noaa.gov/srh/jetstream/tropics/tc_hazards.htm

In addition to storm surge, hurricanes are also known for **damaging winds**. They are rated according to their sustained wind speed. This scale does not account for gusts and squalls. **Gusts** are short and rapid bursts in wind speed. They are caused by turbulence over land mixing faster air aloft to the surface. **Squalls** are longer period of increased wind speeds; they are normally located within the outer rain bands.

Hurricanes, tropical storms, and depressions many times bring torrential rains and flooding. This flooding may last many days after the storm has passed. The strength of the storm does not

always affect the level of flooding. A slow, weak tropical storm can cause more damage due to flooding than a more powerful fast moving hurricane.

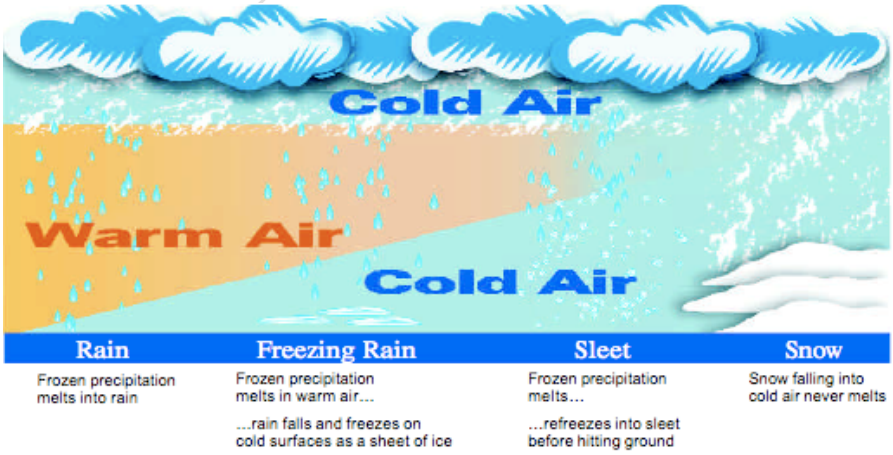
Tornadoes also occur within a tropical cyclone. They are most likely to occur in the right-front quadrant of the storm, but can be embedded within the rain bands well away from the center of the storm. Some hurricanes produce no tornadoes, while others develop numerous ones. According to NOAA studies, half of all land falling hurricanes produce at least one tornado. The effects of a tornado, in addition to hurricane force winds, can produce substantial wind damages. A tornado can develop at any point during landfall, but normally occur within 12 hours after landfall, during daylight hours. Due to the likelihood of a tornado within a hurricane, a tornado watch is normally issued along the anticipated path of a hurricane before landfall.

(The description of hurricanes presented in this section is based upon information extracted from the NOAA publication Hurricanes Unleashing Nature's Fury, A Preparedness Guide, Revised January 2007 at http://www.nws.noaa.gov/om/hurricane/pdfs/HurricanesUNF07.pdf and the NWS Jet Stream Online School for Weather at http://www.srh.noaa.gov/srh/jetstream/tropics/tropics_intro.htm).

Winter Storms/Freezes Description

Winter storms and blizzards originate as mid-latitude depressions or cyclonic weather systems, sometimes following the meandering path of the jet stream. A blizzard combines heavy snowfall, high winds, extreme cold, and ice storms. The origins of the weather patterns that cause severe winter storms are primarily from four sources in the continental United States. Winter storms in the southeast region of the United States are usually a result of Canadian and Arctic cold fronts from the north and mid-western states combining with tropical cyclonic weather systems in the Gulf of Mexico. Typical winter storms in the Southeast include ice storms, crop-killing freezes and occasional snow.

Figure D-7. Types of Winter Precipitation



Source: National Weather Service, Winter Storms, The Deceptive Killers at http://www.weather.gov/os/winter/resources/winterstorm.pdf

Types of events that occur within a winter storm include freezing rain, sleet, blizzards, and frost/freeze. **Freezing rain** is rain that freezes when it hits the ground which coats roads, trees and

power lines. **Sleet** is rain that turns into ice pellets before hitting the ground. A **blizzard** is snowfall with sustained winds or frequent gusts up to 35mph and considerable amounts of blowing snow. The expectation is that blizzard conditions will last 3 or more hours. Freezes occur when the temperatures will go below freezing. Many times frost/freezes cause substantial damage to crops.

(The description of winter storms/freezes presented in this section is extracted from NOAA/NWS's publication Winter Storms, The Deceptive Killers, A Preparedness Guide at http://www.weather.gov/os/winter/resources/winterstorm.pdf).

Droughts/Heat Waves Description

A drought can occur almost anywhere, and its features vary from place to place depending on culture and geography. According to the National Drought Mitigation Center (NDMC), there are four ways of measuring drought. First is a **meteorological drought**, which is a decrease in precipitation in some period of time. These are usually region-specific, and based on a thorough understanding of regional climatology. Meteorological measurements are the first sign of drought. An **agricultural drought** occurs when there is not enough soil moisture to meet the needs of a particular crop at a particular time. Agricultural drought occurs after a meteorological drought, but before hydrological drought. **Hydrological drought** is deficiencies in surface and subsurface water supplies. It is measured as stream flow and at lake, reservoir and groundwater levels. There is a time lag between lack of rain and less water in rivers, streams, reservoirs and lakes. When precipitation is deficient over time, it will show in these water levels. The last type of drought defined by NDMC is a **socioeconomic drought**, which occurs when water shortages begin to affect people. In addition to the impacts discussed above, water level decline due to drought can also cause sinkholes to form.

The draft Alabama Drought Management Plan (2004) by the Office of Water Resources of the Alabama Department of Economic and Community Affairs (ADECA) explains the potential threats of droughts to Alabama and the need for effective drought planning and management, as follows:

In recent years, drought conditions have endangered Alabama's water resources and adversely affected the livelihood of many people. Drought is a natural event that, unlike floods or tornadoes, does not occur in a violent burst but gradually happens; furthermore, the duration and extent of drought conditions are unknown because rainfall is unpredictable in amount, duration and location. The devastation (environmental, social, and economic) experienced in recent years due to drought conditions has not been successfully mitigated because previous responses to drought conditions at all levels of government has been slow and fragmented, with little focus on preparedness and mitigation. In an effort to be more proactive, the Office of Water Resources worked closely with numerous local, state, and federal agencies and other water resources professionals to develop and implement this statewide approach to drought planning and management.

The State drought plan establishes four phases of drought conditions – drought watch, advisory, warning, and emergency – identified by a compilation of drought indices, which include Crop Moisture Index, Palmer Drought Severity Index, Stream Flow, Reservoir Elevation Level, and Groundwater. Each of these phases requires varying levels of management. The U.S. Drought Monitor

by the National Drought Mitigation Center (NDMC) uses a four-tier system to continuously monitor drought intensity based on another combination of drought indices. D1 is the first drought stage with severe conditions, and D4 is most intense drought stage with exceptional drought conditions. D0 includes drought watch areas that are abnormally dry and on the verge of drought or recovering from drought. The primary adverse physical effects of drought are classified as A (adverse impacts to agricultural crops, pastures, and grasslands) or H (adverse impacts to hydrologic resources for water supply, including rivers, reservoirs, and groundwater).

According to NOAA, extreme heat is the number one weather related killer taking an average of 1,500 people in the U.S. annually. The National Weather Service will issue watches and warnings when the heat index is expected to exceed 105°-110° F for at least two consecutive days. The heat index is given in degrees F and is a measure of how hot it really feels when the relative humidity is added to the actual air temperature.

Table D-7. NOAA's National Weather Service Heat Index

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution Extreme Caution Danger Extreme Danger

Source: NOAA at http://www.weather.gov/om/heat/index.shtml

(The description of droughts/extreme heat presented in this section is extracted from: National Drought Mitigation Center, Defining Drought: Overview at http://drought.unl.edu/whatis/define.htm and NOAA, Heat Wave: A Major Summer Killer at http://www.noaawatch.gov/themes/heat.php).

Wildfires Description

Wildfires are a serious and growing hazard over much of the United States, posing great threats to life and property, particularly when moving from rural forest or rangeland into developed urban areas. Millions of acres burn every year in the United States as a result of wildfires, causing

millions of dollars in damage. Each year more than 100,000 wildfires occur in the United States, almost 90 percent of which are started by humans; the rest are caused by lightning. Weather is one of the most significant factors in determining the severity of wildfires. The intensity of fires and the rate with which they spread is directly related to wind speed, temperature, and relative humidity. Climatic conditions, such as long-term drought, also play a major role in the number and the intensity of wildfires.

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires.

A **wildland fire** is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. An **Urban-Wildland Interface fire** is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.

States with a large amount of wooded, brush and grassy areas, such as Alabama, are at highest risk of wildfires. Additionally, areas anywhere that have experienced prolonged droughts or are excessively dry, are also at risk of wildfires. People start more than four out of every five wildfires, usually as debris burns, arson, or carelessness. Lightning strikes are the next leading cause of wildfires. Wildfire behavior is based on three primary factors:

- fuel,
- topography, and
- weather.

The type, and amount of fuel, as well as its burning qualities and level of moisture affect wildfire potential and behavior. The continuity of fuels, expressed in both horizontal and vertical components is also a factor, in that it expresses the pattern of vegetative growth and open areas. Topography is important because it affects the movement of air (and thus the fire) over the ground surface. The slope and shape of terrain can change the rate of speed at which the fire travels. Weather affects the probability of wildfire and has a significant effect on its behavior. Temperature, humidity and wind (both short and long term) affect the severity and duration of wildfires.

Protecting Alabama's rural areas from wildfire is the number one priority of the Alabama Forestry Commission. Wildfires burn thousands of acres of forestlands in Alabama every year. Through the efforts of the Forestry Commission and local volunteer fire departments, those wildfires are decreasing, but they still take a major toll on Alabama's forest resources.



The Forestry Commission has a modern aggressive detection system that allows it to discover and suppress wildfires in the most efficient way possible. A fleet of airplanes regularly patrols over the forest and looks for wildfires. In addition, the public can report wildfires 24 hours a day through a toll-free telephone system. When a fire is reported, a dispatch center sends Forestry Commission crews and volunteer fire departments as needed to suppress it.

Volunteer fire departments are an essential part of the team when it comes to suppressing wildfires. The Forestry Commission works to help establish, train and maintain rural community fire departments in every county. This strong partnership of government and volunteer agencies working together provides cost efficient, effective fire service.

The Forestry Commission suppresses a wildfire by building a "fire break" which contains the fire by removing fuel from the fire so it cannot spread. These breaks are built using a bulldozer outfitted with a fire plow, which cuts a three foot wide trench across the site, removing all vegetation and exposing bare soil. On hilly sites, these firebreaks are built by hand using rakes and other tools by 20 person crews.

In extreme circumstances where several homes are threatened by a wildfire, the Forestry Commission can call in helicopters with large water buckets. These buckets do not put out the fire, but reduce its intensity so that the Commission crew can plow it out. The helicopter service is extremely expensive and is only done in severe fire conditions.

(The description of wildfires presented in this section is based upon information extracted from the FEMA How to Guides Understanding Your Risks (FEMA 386-2), August 2001, Using HAZUS-MH for Risk Assessment How to Guide (FEMA 433), August 2004, and the Alabama Forestry Commission at http://www.forestry.alabama.gov).

Dam/Levee Failures Description



Dam failure or levee failure can occur with little warning. Strong storms may produce a flood in a few hours or minutes for upstream locations, which can cause a dam or levee failure. Flash floods occur within six hours of the beginning of heavy rainfall and dam failure may occur within hours of the first sign of a breach. Dam failures are potentially the worst flood event. There are more than 80,000 dams in the United States according to the 2007 update of the National Inventory of

Dams. According to FEMA, one third of these pose a high or significant hazard to life and property if failure occurs. 56% of dams are privately owned, and the dam owner is responsible for the safety and liability of the dam as well for upkeep, upgrade and repair. This compounds the risk that is posed due to dam or levee failure.

(The description of dam/levee failures presented in this section is extracted from FEMA, Disaster Types, Dam Failure at http://www.fema.gov/hazard/damfailure/index.shtm).

Landslides Description

Landslides occur and can cause damage in all 50 States, at an annual cost of about $3.5 billion per year (2005). Between 25 and 50 deaths per year in the U.S. are attributable to landslides. Landslides cause damage to the natural environment and economic losses, due to reduced real estate values, decreased agricultural and forestry productivity, among other adverse economic effects.

Severe storms, earthquakes, coastal wave attack, and wildfires can cause widespread slope instability and result in landslides. Landslide danger may be high, even as emergency personnel are providing rescue and recovery services for these other hazard events.

A landslide is a downward and outward movement of slope-forming soil, rock, and vegetation under the influence of gravity, which includes a wide range of ground movement. Numerous types of events, including natural and human-caused changes within the environment, can trigger landslides. Examples of these changes that cause weaknesses in the composition or structures of the rock or soil include heavy rain, changes in ground water level, seismic activity, or construction activity. Human-caused landslides may result from activities such as terracing, cut and fill construction, building construction, mining operations, and changes in irrigation or surface runoff.



There are different types of landslides. **Rock falls** are rapid movement of bedrock characterized by free-fall, bouncing and rolling. **Slides** are movements of soil or rock along a distinct surface of rupture that separates the slide material from the more stable underlying material. There are two major types of slides: rotational and translational slides. In a **rotational slide** the surface of rupture is curved concavely upward and the slide block rotates around an axis parallel to the slope contours. A **translational slide** is a mass that moves down and outward along a relatively planar surface with little rotational movement or backward tilting. **Flows** are mass movements of water-saturated material. The movement of flows can be extremely rapid (debris avalanche), very rapid (debris flow) or very slow (earth flow).

Here are some significant landslide facts from the USGS:

- Landslides often accompany earthquakes, floods, storm surges, hurricanes, wildfires, or volcanic activity. They are often more damaging and deadly than the triggering event (examples: the 1964 Alaska earthquake-induced landslides and the 1980 Mount St. Helens volcanic debris flow).
- Human activities and population expansion are major factors in increased landslide damage and costs.
- The May 1980 eruption of Mount St. Helens caused the largest landslide in history— a rock slide-debris avalanche large enough to fill 250 million dump trucks to the brim traveled about 14 miles, destroying nine highway bridges, numerous private and public buildings, and many miles of highways, roads, and railroads. The debris avalanche also formed several new lakes by damming the North Fork Toutle River and its tributaries. These lakes posed hazards to downstream communities because of the possible failure of the dams, which could have resulted in catastrophic flooding.
- Although the National Flood Insurance Act covers certain damage from "mudflows," insurance against landslides is generally unavailable in most areas of the United States. As a result, many victims of landslides resort to litigation in order to recover damages.

(The description of landslides presented in this section is extracted from the Geological Survey of Alabama, Geologic Hazards Section at http://www.gsa.state.al.us/gsa/geologichazards/landslides/index.html and the U.S.G.S. Landslides Hazards Program at http://landslides.usgs.gov).

Earthquakes Description

An earthquake is the shaking and vibration at the surface of the earth resulting from underground movement along a fault plane. Earthquakes are caused by the release of built-up stress within rocks along geologic faults or by the movement of magma in volcanic areas. They usually occur without warning and are usually followed by aftershocks. Earthquakes can affect hundreds of thousands of square miles and cause tens of billions of dollars of damage to property. An earthquake event can cause injury and loss of life to hundreds of thousands of persons and can greatly disrupt the social and economic functioning of the affected area. Secondary hazards during an earthquake may occur, such as surface faulting, liquefaction, sinkholes, and landslides.

Earthquakes are caused by the rupture or sudden movement of a fault where stresses have accumulated along fault planes within the earth's crust. While most earthquakes and active faults occur along the borders of the earth's tectonic plates, other active faults and earthquake zones lie within plates (intraplate).The plates range from less than 10 miles (for young oceanic crust) to 125 miles (for older continental crust), and are in continuous motion, grinding against or ripping away from each other. All of this motion creates stress within the rock and along either side of faults. While rock can bend over time under this stress, if the stress exceeds the rock's elastic limit, a break or sudden shift occurs.

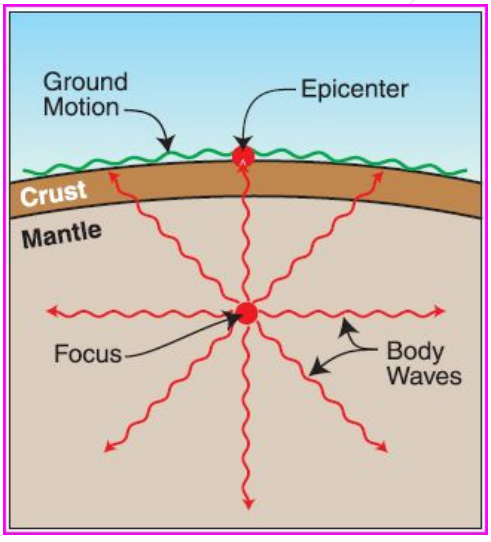
The area of greatest seismic activity in the United States is along the Pacific coast in California and Alaska, but as many as forty states can be characterized as having at least moderate earthquake risk. For example, seismic activity has been recorded in Boston, Massachusetts; New Madrid, Missouri; and Charleston, South Carolina, places not typically thought of as earthquake zones. While some areas have frequent earthquakes, such as in California, forecasting when and where an earthquake will occur is not yet possible. Records show that building inventories in 39 states are vulnerable to earthquake damage.

While most property damage from earthquakes in general is due to nonstructural damage, structural damage and deaths can result from strong magnitude earthquakes or moderate magnitude earthquakes for older structures or structures with lower seismic building designs. Ground shaking is caused by seismic waves generated by the earthquake. The intensity of shaking is influenced by magnitude, distance from the earthquake's epicenter, and regional geology.



Earthquakes create seismic waves that consist of both primary and secondary waves. These waves emanate from the point at which movement first occurs (the focus). While primary waves (body waves) travel within the earth, secondary waves (surface waves), travel through the crust and create the ground shaking that we feel and that can be damaging to structures. See Figure D-8 for illustration of this concept.

Figure D-8. Seismic and Surface Waves



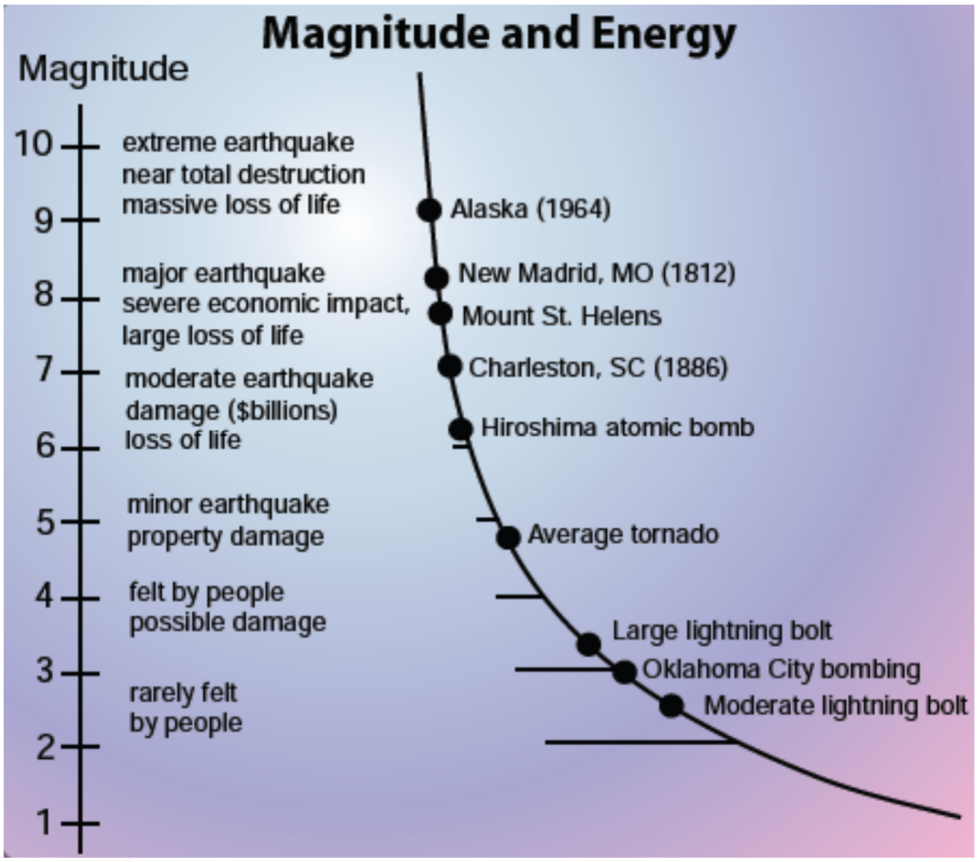
In addition to direct structural damage from earthquake shaking, triggered landslides can also damage structures. Earthquake-induced landslides can occur miles from the epicenter and can result from shaking of over-steepened or weak slopes. They can destroy roads, buildings, utilities, and other critical facilities necessary to respond to or recover from an earthquake. As sloped lands are developed, earthquake-induced landslides pose additional threats to homes and infrastructure. Soil type can substantially increase earthquake risk. **Liquefaction** occurs, when ground shaking causes saturated soft soils to change from a solid to a liquid state.

Liquefaction results in the loss of soil strength and three potential types of ground failure: lateral spreading, flow failure, and loss of bearing strength. Buildings and their occupants are at risk when the ground can no longer support buildings and structures. Areas susceptible to liquefaction include areas with high ground water tables and sandy

soils. The extreme earthquake damage to San Francisco in 1989 was due to liquefaction of the soil used to fill in waterfront properties.

Amplification (strengthening) of shaking also results in areas with soils that are soft, thick, and/or have high water content, such as floodplains, coastal lowlands, infilled areas, and ancient river or marine deposits. Amplification increases the magnitude of the seismic waves generated by the earthquake.

Chart D-1. Earthquake Magnitude Scale



Source: USGS

Seismic activity is described in terms of magnitude and intensity. **Magnitude** describes the total energy released and **intensity** describes the effects at a particular location. Magnitude is defined as the measure of the amplitude of the seismic wave and is expressed by the Richter scale. The **Richter scale** is a logarithmic measurement where an increase in the scale by one whole number represents a tenfold increase in the measured amplitude of the earthquake.

Intensity is defined as the measure of the strength of the shock at a particular location and is expressed by the **Modified Mercalli Intensity (MMI) scale**. The modern MMI scale is a modification by the Italian volcanologist Giuseppe Mercalli of an older 1800s scale. Mercalli's scale was later published in English in 1931 by American seismologists Harry Wood and Frank Neumann and later

modified by Charles Richter. The scale consists of a series of certain key responses such as people awakening, movement of furniture, the damage to structures, and total destruction. The *lower* numbers of the intensity scale generally deal with the manner in which the earthquake is felt by people. The *higher* numbers of the scale are based on observed non-structural and structural damage. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. It does not have a mathematical basis; instead it is a ranking based on observed effects. Table D-8 below describes the Modified Mercalli Intensity scale and its description of effects.

Table D-8. Modified Mercalli Intensity Scale

SCALE	INTENSITY	DESCRIPTION OF EFFECTS
I	Instrumental	Detected only on seismographs
II	Feeble	Some people feel it
III	Slight	Felt by people resting; like a truck rumbling by
IV	Moderate	Felt by people walking
V	Slightly Strong	Sleepers awake; church bells ring
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves
VII	Very Strong	Mild Alarm; walls crack; plaster falls
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged
IX	Ruinous	Some houses collapse; ground cracks; pipes break open
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves

Source: FEMA

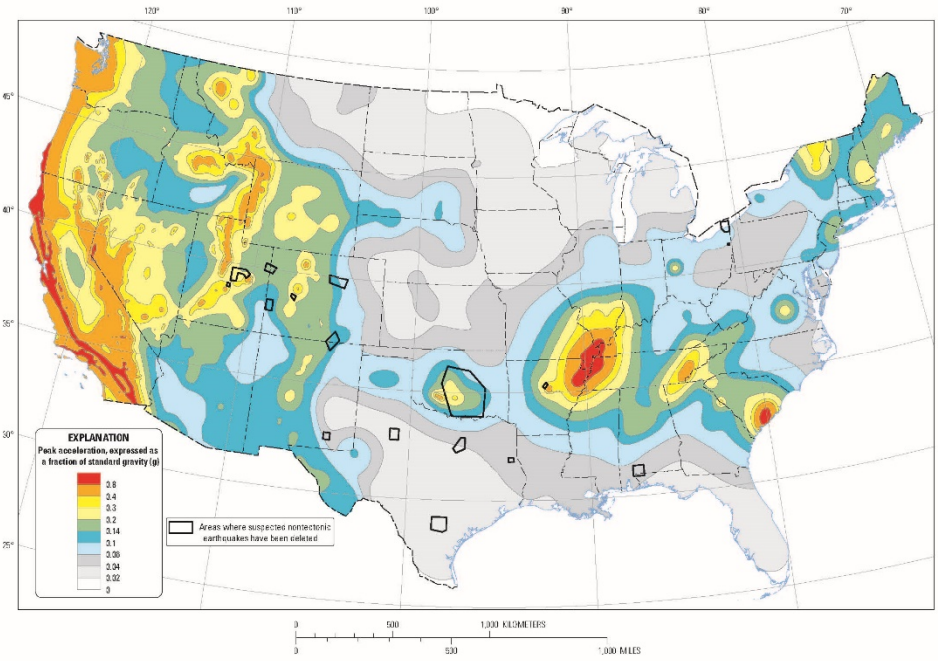
Another measurement of seismic activity is **Peak Ground Acceleration (PGA)** which measures the rate of change of motion relative to the rate of acceleration due to gravity. An object falling to Earth will fall faster and faster, until it reaches terminal velocity. This principle is known as **acceleration** and represents the rate at which speed is increasing. This movement can be described by its changing

position as a function of time, or by its acceleration as a function of time. The peak acceleration is the maximum acceleration experienced by the object during the course of the earthquake motion. Peak ground acceleration can be measured in *g* (the acceleration due to gravity at the earth's surface is 9.8 meters per second squared). For example, acceleration of the ground surface of 244 cm/sec/sec (where *g* equals 9.8 meters per second squared) equals a PGA of 25.0 percent.

Map D-2 below shows the 2008 Peak Ground Acceleration (PGA) values for the southeast United States with a 2% chance of being exceeded over 50 years. This is a common earthquake measurement that shows three things: the geographic area affected, the level of acceleration that could be exceeded (color scale), and the probability of exceeding that level within a given time period (probability and time stated in the title).

Map D-2. 2014 PGA for U.S.

Peak Ground Acceleration with 2% Probability of Exceedance in 50 Years



Two-percent probability of exceedance in 50 years map of peak ground acceleration

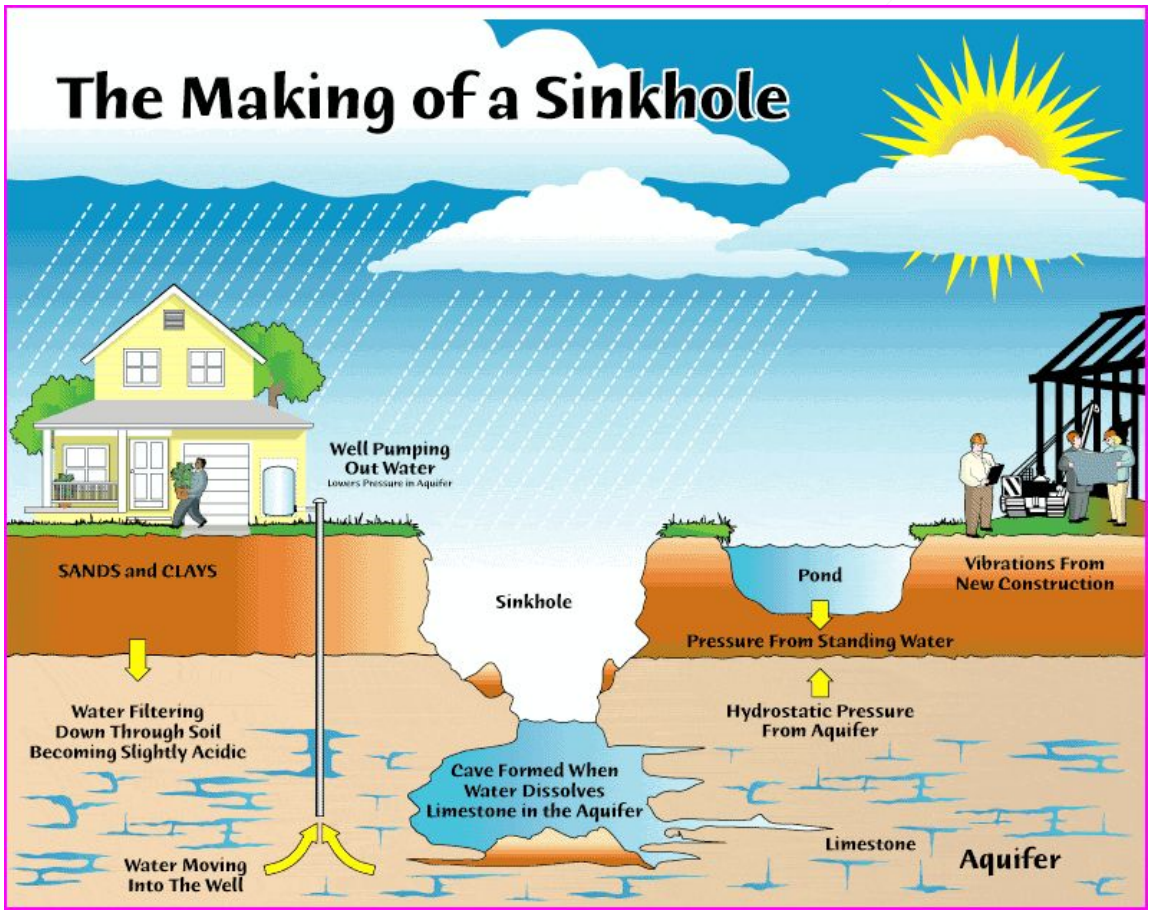
Source: U.S. Geological Survey Earthquake Hazards Program

(The description of earthquakes presented in this section is based upon information extracted from the FEMA How to Guides Understanding Your Risks (FEMA 386-2), August 2001, Using HAZUS-MH for Risk Assessment How to Guide (FEMA 433), August 2004, 2007 Alabama State Hazard Mitigation Plan, U.S. Geological Survey Earthquakes Hazard Program, guidance from the Geological Survey of Alabama, and various FEMA-adopted plans).

Sinkholes (Land Subsidence) Description

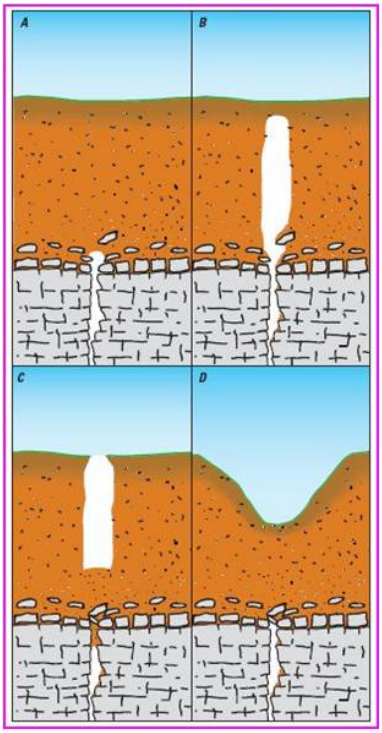
Sinkholes are a naturally occurring geologic feature that can be hazardous to property and the environment. Their formation is due to water dissolving rock below the land surface. The types of rock most susceptible to sinkhole formation are salt and carbonate rocks such as limestone, dolomite, and marble. As bedrock dissolves, voids (such as caves and caverns) develop underground; when a void is large enough, the void's roof collapses, and the ground above falls in, leaving a visible sinkhole at the surface. While some sinkholes form as dramatic instant collapses, the vast majority of sinkholes develop slowly over time, with the ground slowly sinking downward. Although normally no more than a nuisance, some sinkholes can become very large and a house or road may be on top when the collapse occurs. See Figure D-9, which shows the making of a sinkhole. Figure D-10 illustrates the formation of a collapse.

Figure D-9. The Making of a Sinkhole



Source: Southwest Florida Water Management District

Figure D-10. Formation of a Collapse



A - Soil bridges gap where sediment has been washing into a solution enlarged fracture.

B - Over time, the void migrates upward through the soil.

C - After the bridge thins, a sudden collapse occurs.

D - The collapse often plugs the drain and erosion will, after many years, transform the collapse into a more bowl-shaped sinkhole.

Source: U.S. Geological Survey Mid-Continent Geographic Science Center

Sinkholes range in size from a few square feet to hundreds of acres. They may be quite shallow or may extend hundreds of feet deep. The most damage from sinkholes tends to occur in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania. The picture in Figure D-11 shows a sinkhole that quickly opened up causing major damage to a house and yard.

Figure D-11. Sinkhole Collapse of House



Source: U.S. Geological Survey, Water Science for Schools

Water is the most important agent effecting sinkhole development. Areas can become more susceptible to sinkholes when there is a drawdown of groundwater, heavy rains occur, or the land surface is changed. Changes to land such as increased development can add stress to the roof of a void, thus increasing chance of void collapse and sinkhole formation. Drainage for construction purposes or dewatering from mining or quarrying operations can also lower groundwater levels, reducing support for a void's roof. When water resources for populations or agriculture are overused, groundwater drawdown can occur, increasing likelihood of sinkhole development. Groundwater levels can also be lowered naturally during times of drought, when groundwater is not replenished by rainfall. Conversely, heavy rainfall can also lead to increased sinkhole development as rock dissolution increases or underground washouts occur, eroding supporting rock and soil.

Sinkholes also threaten water and environmental resources by draining streams, lakes, reservoirs, and wetlands, and creating pathways for transmitting surface waters directly into underlying aquifers. Where these pathways are developed, movement of surface contaminants into the underlying aquifer systems can persistently degrade ground-water resources. In some areas, sinkholes are used as storm drains, and because they are a direct link with the underlying aquifer systems it is important that their drainage areas be kept free of contaminants. Conversely, when sinkholes become plugged, they can cause flooding by capturing surface-water flow and can create new wetlands, ponds, and lakes.

(The description of sinkholes presented in this section is based upon information extracted from the FEMA How to Guide Understanding Your Risks (FEMA 386-2), FEMA, August 2001, and other sources from the Geological Survey of Alabama Geological Hazards Program, Southwest Florida Water Management District, and the U.S. Geological Survey Mid-Continent Geographic Science Center).

Human-caused and Technological Hazards Description

Human-caused and technological hazards are hazards that originate from human activity. The two categories of human-caused and technological hazards are **technological hazards** and **terrorism**. Technological hazards are accidental with unintended consequences. They often include the manufacture, transportation, storage and use of hazardous materials. The definition of terrorism has been established by Federal law, as follows: *"Terrorism includes the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives." 28 CFR Section 0.85.* In comparison to technological hazards, acts of terrorism are not accidental and the consequences are intentional.

Technological hazards are divided into three categories: fixed facility industrial accident, transportation industrial accident, and the failure of a supervisory control system. For an industrial accident, the hazard will either exist at a fixed location such as a manufacturing plant or storage facility, or while in transport, i.e. in a vehicle that is transporting it from one location to another, or while it is moving through a pipeline from one location to another. Supervisory control system failure will affect which ever component within the system it is directing and the extents of the damage possible due to failure are usually easy to predict.

Terrorism includes: the use of weapons of mass destruction – biological, chemical, nuclear, and radiological weapons, explosives, and incendiary devices; arson; armed attacks; agriterrorism; an intentional hazardous materials release; industrial sabotage; and cyber-terrorism. It can be carried out domestically or internationally, by known or unknown assailants, locally or from a distance.

Human-caused and technological hazards are very difficult to assess, terrorism more so than technological hazards. Since terrorism involves the human mind and what actions a person may choose to take, the what, where, how and when is largely unpredictable. On the other hand, with technological hazards, since they primarily involve hazardous materials, the assessment of the manufacture, storage, transportation and use of the materials can at least answer to some degree the where, what and how and those answers can aid in the mitigation of some possible technological disasters. For this reason: ***the scope of human-caused and technological hazards addressed by the Mitigation Strategy in this plan is limited to mitigation of fixed location technological hazards involving hazardous materials***.

The extent of the effects of a human-caused hazard can range from localized to widespread, depending on the type of incident, the mode of application, duration, dynamic/static characteristic and mitigating conditions. A conventional bomb could damage a building in which it was placed or an entire city can be in danger if a hazardous material is released into the water supply. Three noted modes of force to the built environment involved by Human-caused hazards are: contamination, energy, and failure or denial or service. If a hazard remains for an extended period of time, the damage can be far reaching; however, if the hazard lasts for only a short time, the damage can usually be quickly determined and response can be swift and the disaster contained. A dynamic hazard is more damaging and unpredictable than a static hazard. Mitigating conditions can be deterrents or they can at least lessen the effects of a hazard at a certain location which also affects the extent of a disaster.

When trying to mitigate human-caused hazards, measures must address security, unknown risks and civil liberties; concerns not raised by natural disasters. The events will usually occur in specific locations and mitigation measures can usually aid in the alleviation of human-caused disasters. Those specific locations are known as critical facilities. In addition to the facilities usually addressed in vulnerability assessments for natural hazards, the following critical infrastructure is usually assessed: agriculture and food, water, public health, emergency services, defense industrial base, telecommunications, energy, transportation, banking and finance, chemicals and hazardous materials, and postal and shipping. Threats to infrastructure can be carried out by anyone who has the knowledge, opportunity and desire to do harm. They can be anyone from terrorists to upset employees and are therefore largely unidentifiable.

Table D-9 “Event Profiles for Terrorism and Technological Hazards,” (from the FEMA “How to Guide” for human-caused and technological hazards) explains the ways in which human-caused and technological hazards can interact with the built environment. As presented in the FEMA Guide, for each type of hazard, the following factors are addressed:

- ***Application mode*** describes the human act(s) or unintended event(s) necessary to cause the hazard to occur.
- ***Duration*** is the length of time the hazard is present on the target. For example, the duration of a tornado may be just minutes, but a chemical warfare agent such as mustard gas, if not remediated, can persist for days or weeks under the right conditions.
- The ***dynamic/static characteristic*** of a hazard describes its tendency, or that of its effects, to either expand, contract, or remain confined in time, magnitude, and space. For example, the physical destruction caused by an earthquake is generally confined to the place in which it occurs, and it does not usually get worse unless there are aftershocks or other cascading failures; in contrast, a cloud of chlorine gas leaking from a storage tank can change location by drifting with the wind and can diminish in danger by dissipating over time.
- ***Mitigating conditions*** are characteristics of the target and its physical environment that can reduce the effects of a hazard. For example, earthen berms can provide protection from bombs; exposure to sunlight can render some biological agents ineffective; and effective perimeter lighting and surveillance can minimize the likelihood of someone approaching a target unseen. In contrast, *exacerbating conditions* are characteristics that can enhance or magnify the effects of a hazard. For example, depressions or low areas in terrain can trap heavy vapors, and a proliferation of street furniture (trash receptacles, newspaper vending machines, mail boxes, etc.) can provide concealment opportunities for explosive devices.

Table D-9. Event Profiles for Terrorism and Technological Hazards

Human-caused Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
Armed Attack	Tactical assault or sniping from remote location.	Generally minutes to days.	Varies based upon the perpetrators' intent and capabilities.	Inadequate security can allow easy access to target, easy concealment of weapons and undetected initiation of an attack.

Human-caused Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
Biological Agent	Liquid or solid contaminants can be dispersed using sprayers/aerosol generators or by point or line sources such as munitions, covert deposits and moving sprayers.	Biological agents may pose viable threats for hours to years depending on the agent and the conditions in which it exists.	Depending on the agent used and the effectiveness with which it is deployed, contamination can be spread via wind and water. Infection can be spread via human or animal vectors.	Altitude of release above ground can affect dispersion; sunlight is destructive to many bacteria and viruses; light to moderate wind will disperse agents but higher winds can break up aerosol clouds; the micrometeorological effects of buildings and terrain can influence aerosolization and travel of agents.
Conventional Bomb/ Improvised Explosive Device	Detonation of explosive device on or near target; delivery via person, vehicle, or projectile.	Instantaneous; additional "secondary devices" may be used, lengthening the time duration of the hazard until the attack site is determined to be clear.	Extent of damage is determined by type and quantity of explosive. Effects generally static other than cascading consequences, incremental structural failure, etc.	Overpressure at a given standoff is inversely proportional to the cube of the distance from the blast; thus, each additional increment of standoff provides progressively more protection. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting energy and debris. Exacerbating conditions include ease of access to target; lack of barriers/shielding; poor construction; and ease of concealment of device.

Human-caused Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
Chemical Agent	Liquid/aerosol contaminants can be dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles/ containers; or munitions.	Chemical agents may pose viable threats for hours to weeks depending on the agent and the conditions in which it exists.	Contamination can be carried out of the initial target area by persons, vehicles, water and wind. Chemicals may be corrosive or otherwise damaging over time if not remediated.	Air temperature can affect evaporation of aerosols. Ground temperature affects evaporation of liquids. Humidity can enlarge aerosol particles, reducing inhalation hazard. Precipitation can dilute and disperse agents but can spread contamination. Wind can disperse vapors but also cause target area to be dynamic. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects.
Arson/ Incendiary Attack	Initiation of fire or explosion on or near target via direct contact or remotely via projectile.	Generally minutes to hours.	Extent of damage is determined by type and quantity of device/accelerant and materials present at or near target. Effects generally static other than cascading consequences, incremental structural failure, etc.	Mitigation factors include built-in fire detection and protection systems and fire-resistive construction techniques. Inadequate security can allow easy access to target, easy concealment of an incendiary device and undetected initiation of a fire. Non-compliance with fire and building codes as well as failure to maintain existing fire protection systems can substantially increase the effectiveness of a fire weapon.
Cyber-terrorism	Electronic attack using one computer system against another.	Minutes to days.	Generally no direct effects on built environment.	Inadequate security can facilitate access to critical computer systems, allowing them to be used to conduct attacks.

Human-caused Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
Agriterrorism	Direct, generally covert contamination of food supplies or introduction of pests and/or disease agents to crops and livestock.	Days to months.	Varies by type of incident. Food contamination events may be limited to discrete distribution sites, whereas pests and diseases may spread widely. Generally no effects on built environment.	Inadequate security can facilitate adulteration of food and introduction of pests and disease agents to crops and livestock.
Radiological Agent	Radioactive contaminants can be dispersed using sprayers/aerosol generators, or by point or line sources such as munitions, covert deposits and moving sprayers.	Contaminants may remain hazardous for seconds to years depending on material used.	Initial effects will be localized to site of attack; depending on meteorological conditions, subsequent behavior of radioactive contaminants may be dynamic.	Duration of exposure, distance from source of radiation, and the amount of shielding between source and target determine exposure to radiation.
Nuclear Bomb	Detonation of nuclear device underground, at the surface, in the air or at high altitude.	Light/heat flash and blast/shock wave last for seconds; nuclear radiation and fallout hazards can persist for years. Electromagnetic pulse from a high altitude detonation lasts for seconds and affects only unprotected electronic systems.	Initial light, heat and blast effects of a subsurface, ground or air burst are static and are determined by the device's characteristics and employment; fallout of radioactive contaminants may be dynamic, depending on meteorological conditions.	Harmful effects of radiation can be reduced by minimizing the time of exposure. Light, heat and blast energy decrease logarithmically as a function of distance from seat of blast. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting radiation and radioactive contaminants.

Human-caused Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
Hazardous Material Release (fixed facility or transportation)	Solid, liquid and/or gaseous contaminants may be released from fixed or mobile containers.	Hours to days.	Chemicals may be corrosive or otherwise damaging over time. Explosion and/or fire may be subsequent. Contamination may be carried out of the incident area by persons, vehicles, water and wind.	As with chemical weapons, weather conditions will directly affect how the hazard develops. The micrometeorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. Non-compliance with fire and building codes as well as failure to maintain existing fire protection and containment features can substantially increase the damage from a hazardous materials release.

(The information presented in this section was extracted from the FEMA How to Guide Integrating Human-caused Hazards into Mitigation Planning, FEMA 386-7 Version 2.0, FEMA, September 2003).

Pandemics and Infectious Disease

Infectious diseases are illnesses caused by organisms such as bacteria, viruses, parasites and fungi. These diseases can be transmitted directly or indirectly from person to person, and some can even be transferred to humans from animals. Exposure to infectious diseases is not uncommon and some common ones are the common cold, influenza, chicken pox and stomach viruses. Some infectious diseases like polio, measles, and tuberculosis have been all but eradicated in the United States due to vaccines and improvements in other prevention practices and treatments. Herd immunity has also lessened the effects of many of the more common types of disease.

A pandemic is a global outbreak of an infectious disease that results in infection of an extensive number of people. Pandemics are very rare but can cause major disruptions due to compromising the health of citizens, taking lives and even compromising the economy. Most pandemics are the result of mutations of existing diseases, resulting in a new disease that the populous has yet to develop an immunity to. In addition to a lack of immunity, creation of a vaccine can take months which can delay the control of the spread of the disease, leading to more people getting sick and possibly dying. During a pandemic, healthcare resources are often overwhelmed so treatments are unable to be offered efficiently due to lack of supplies, manpower, and space for patients.

There have been 6 pandemics in the United States since 1918. Four of these pandemics were influenza pandemics, including the H1N1 pandemic in 2009. The Zika Virus pandemic affected the United States from 2015-2016 and the most recent pandemic, COVID-19, began at the end of 2019 and is still ongoing at the time of this plan update.

Influenza is a virus that is transmitted by person-to-person contact, usually through coughing or sneezing. There is an influenza season every year in the winter in the United States and a vaccine is available for the most common strain of the virus. However, occasionally the virus mutates and a pandemic can occur. There have been four influenza pandemics in the United States in the past century. The Spanish Influenza Pandemic in 1918 claimed the lives of 675,000 Americans and 50 million people worldwide. From 1957-1958, the influenza pandemic was caused by the H2N2 virus and killed 116,000 people in the United States during that time. Ten years later, in 1968, another influenza pandemic hit the United States; the virus that caused this pandemic was the H3N2 virus and caused the deaths of 100,000 Americans, most of them over the age of 65. More recently, the H1N1 virus caused an influenza pandemic in 2009 which killed over 12,000 people in the United States. The unusual thing about this particular strain of influenza is that the deaths were primarily in those under the age of 65 where most influenza viruses cause death for those over 65. Medical experts believe that future influenza pandemics, although rare, are inevitable.

The Zika Virus pandemic lasted from 2015-2016. The virus was transmitted by mosquitoes carrying the virus or by sexual contact with an infected person. Effects of Zika virus are usually mild; however, unborn babies are most at risk because the virus can cause microcephaly, an abnormally small cranium, which can result in delays in mental and physical development and even death of the fetus. There were 43 cases of Zika-related microcephaly in the United States between 2015 and 2016. In total, there were over 5,000 cases of the virus across the country during the peak year of the pandemic in 2016. There is no vaccine or cure for Zika but pest control can help to prevent the spread of the virus by controlling the mosquito population. The virus has all but disappeared in the United States and there were no cases reported in 2018 or 2019 that originated from within the US.

Most recently, the COVID-19 pandemic, which has affected the United States extensively, developed in China in 2019 and spread around the world quickly and aggressively. Within a month of the first report to the World Health Organization, the virus was declared a world health emergency. Since its beginning and as of December 2020, COVID-19 has killed over 1.54 million people worldwide, 282,000 of those occurring in the United States. This virus is a new form of coronavirus which means that there is no immunity to this particular strain and there is also no vaccine. Also, there is no cure for COVID-19 and most people are able to overcome the virus with rest and symptom management. Others who recover from the virus require hospitalization to address the symptoms which can include impaired lung function requiring the use of oxygen treatment and, in some cases, a ventilator. Those most at risk for serious complications or death from COVID-19 are the elderly, the immunocompromised, or those with existing respiratory disorders.

It is prudent for a response plan to be created before a pandemic occurs with allowances made for multiple potential scenarios. These response measures should include securing access to supplies and space to treat infected persons. Preventative measures should also be included to address reduction of the spread of a pandemic level infectious disease. Schools and hospitals are particularly at risk for the spread of infectious disease so special consideration should be given to these venues in any response plan. Limiting travel to and from the area is a possible mitigation measure for inclusion when preparing to address a pandemic.

Appendix E
Hazard Profile Data

App. E - Hazard Profile Data

This appendix contains records of previous occurrences of hazard events reported in Section 5.3 "Hazard Profiles," for events reported by the National Weather Service and National Climatic Data Center. The following is information about the storm data provided by the National Weather Service and its limitations as presented in the document NATIONAL WEATHER SERVICE INSTRUCTION 10-1605. Dated July 16, 2018.

Storm Data Disclaimer. Storm Data is an official publication of the National Oceanic and Atmospheric Administration (NOAA) which documents:

a. The occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce;

b. Rare, unusual, weather phenomena that generate media attention, such as snow flurries in South Florida or the San Diego coastal area; and

c. Other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occur in connection with another event.

While Storm Data serves as official input to the NWS verification system for select programs, the primary purpose of Storm Data is to accurately describe events, regardless of the impact on verification scores.

Some information appearing in Storm Data may be provided by or gathered from sources outside the National Weather Service (NWS), such as the media, law enforcement and/or other government agencies, emergency managers, private companies, individuals, etc. An effort is made to use the best available information, but because of time and resource constraints, information from these sources may be unverified by the NWS. Accordingly, the NWS does not guarantee the accuracy or validity of the information. Further, when information appearing in Storm Data originated from a source outside the NWS (frequently credit is provided), Storm Data users requiring additional information should contact that source directly.

Legend for NCDC Data

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Table E-1. Marshall County Severe Storm Events, 1994-2019

6 Precipitation events were reported in Marshall County, Alabama between 01/01/1994 and 8/4/2019.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Arab	3/27/1994	0	Heavy Rain	N/A	0	0	0.00K	0.00K
2 Countywide	6/1/1997	12:00 AM	Heavy Rain	N/A	0	0	0.00K	50.00K
3 Albertville	6/28/1999	3:00 PM	Heavy Rain	N/A	1	1	0.00K	0.00K
6 BOAZ	4/20/2011	23:25	Heavy Rain	N/A	0	0	0.00K	0.00K
Countywide	12/12/2018		Heavy Rain	N/A	0	0	0.00K	0.00K
Countywide	8/4/2019		Heavy Rain	N/A	0	0	0.00K	0.00K
				TOTALS:	1	1	0.00K	50.00K

Source: National Climatic Data Center

Table E-2. Marshall County Thunderstorm and High Wind Events, 1960-2013

425 Thunderstorm and High Wind events were reported in Marshall County, Alabama between 01/01/1960 and 09/14/2019.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 MARSHALL	6/9/1960	1500	T'stm Wind	0kts.	0	0	0	0
2 MARSHALL	3/18/1961	2300	T'stm Wind	53kts.	0	0	0	0
3 MARSHALL	4/17/1964	900	T'stm Wind	0kts.	0	0	0	0
4 MARSHALL	4/12/1965	230	T'stm Wind	0kts.	0	0	0	0
5 MARSHALL	5/7/1967	130	T'stm Wind	0kts.	0	0	0	0
6 MARSHALL	7/8/1969	1630	T'stm Wind	0kts.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
7 MARSHALL	5/27/1973	1440	T'stm Wind	0kts.	0	0	0	0
8 MARSHALL	1/28/1974	815	T'stm Wind	0kts.	0	0	0	0
9 MARSHALL	3/7/1975	1340	T'stm Wind	0kts.	0	0	0	0
10 MARSHALL	6/14/1975	1500	T'stm Wind	0kts.	0	0	0	0
11 MARSHALL	6/20/1975	2130	T'stm Wind	0kts.	0	0	0	0
12 MARSHALL	4/4/1977	1150	T'stm Wind	0kts.	0	0	0	0
13 MARSHALL	4/8/1979	2355	T'stm Wind	75kts.	0	0	0	0
14 MARSHALL	5/31/1981	1200	T'stm Wind	0kts.	0	0	0	0
15 MARSHALL	7/24/1981	1730	T'stm Wind	0kts.	0	0	0	0
16 MARSHALL	5/31/1982	1700	T'stm Wind	0kts.	0	0	0	0
17 MARSHALL	11/20/1983	140	T'stm Wind	0kts.	0	0	0	0
18 MARSHALL	11/23/1983	1400	T'stm Wind	0kts.	0	0	0	0
19 MARSHALL	3/27/1984	2013	T'stm Wind	0kts.	0	0	0	0
20 MARSHALL	7/22/1984	1730	T'stm Wind	0kts.	0	0	0	0
21 MARSHALL	4/5/1985	1635	T'stm Wind	0kts.	0	0	0	0
22 MARSHALL	4/5/1985	1710	T'stm Wind	0kts.	0	0	0	0
23 MARSHALL	6/7/1985	1645	T'stm Wind	0kts.	0	0	0	0
24 MARSHALL	6/7/1985	1645	T'stm Wind	0kts.	0	0	0	0
25 MARSHALL	6/25/1985	1530	T'stm Wind	0kts.	0	0	0	0
26 MARSHALL	7/10/1985	2050	T'stm Wind	0kts.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
27 MARSHALL	7/10/1985	2110	T'stm Wind	0kts.	0	0	0	0
28 MARSHALL	7/15/1985	1755	T'stm Wind	0kts.	0	0	0	0
29 MARSHALL	7/15/1985	1811	T'stm Wind	0kts.	0	0	0	0
30 MARSHALL	8/1/1985	1635	T'stm Wind	0kts.	0	0	0	0
31 MARSHALL	12/1/1985	915	T'stm Wind	0kts.	0	0	0	0
32 MARSHALL	2/17/1986	2103	T'stm Wind	0kts.	0	0	0	0
33 MARSHALL	2/17/1986	2155	T'stm Wind	0kts.	0	0	0	0
34 MARSHALL	3/13/1986	120	T'stm Wind	0kts.	0	0	0	0
35 MARSHALL	7/28/1986	2030	T'stm Wind	0kts.	0	0	0	0
36 MARSHALL	7/6/1987	1710	T'stm Wind	0kts.	0	0	0	0
37 MARSHALL	1/19/1988	1830	T'stm Wind	0kts.	0	0	0	0
38 MARSHALL	7/16/1988	1250	T'stm Wind	0kts.	0	0	0	0
39 MARSHALL	9/24/1988	1800	T'stm Wind	0kts.	0	0	0	0
40 MARSHALL	6/12/1989	1810	T'stm Wind	0kts.	0	0	0	0
41 MARSHALL	6/12/1989	1810	T'stm Wind	0kts.	0	0	0	0
42 MARSHALL	11/15/1989	1730	T'stm Wind	0kts.	0	0	0	0
43 MARSHALL	8/4/1990	1735	T'stm Wind	0kts.	0	0	0	0
44 MARSHALL	8/18/1990	1740	T'stm Wind	0kts.	0	0	0	0
45 MARSHALL	8/29/1990	2222	T'stm Wind	0kts.	0	0	0	0
46 MARSHALL	4/8/1991	1235	T'stm Wind	0kts.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
47 MARSHALL	4/27/1991	1445	T'stm Wind	0kts.	0	0	0	0
48 MARSHALL	6/4/1991	1628	T'stm Wind	0kts.	0	0	0	0
49 MARSHALL	3/10/1992	157	T'stm Wind	0kts.	0	0	0	0
50 MARSHALL	3/10/1992	240	T'stm Wind	0kts.	0	0	0	0
51 MARSHALL	6/18/1992	1615	T'stm Wind	0kts.	0	0	0	0
52 MARSHALL	7/5/1992	1300	T'stm Wind	65kts.	0	0	0	0
53 MARSHALL	4/15/1993	615	Thunderstorm Winds	0kts.	0	0	0	0
54 Arab; Martling & Pop.	4/15/1994	915	Thunderstorm Winds/hail	1kts.	0	0	5K	0
55 MARSHALL	5/15/1994	1920	Thunderstorm Winds	0kts.	0	0	5K	0
56 Guntersville	6/16/1994	1800	Thunderstorm Winds	50kts.	0	0	500K	0
57 Grant	6/26/1994	2218	Thunderstorm Winds	0kts.	0	0	50K	0
58 Grant And Union Grove	6/29/1994	549	Thunderstorm Winds	50kts.	0	0	5K	0
59 Grant	3/7/1995	1805	Thunderstorm Winds	0kts.	0	0	0	0
60 Swearengin	3/7/1995	1832	Thunderstorm Winds	0kts.	0	0	5K	0
61 Albertville	6/6/1995	2002	Thunderstorm Winds	0kts.	0	0	25K	0
62 Guntersville	6/10/1995	1300	Thunderstorm Winds	50kts.	0	0	10K	0
63 Guntersville Union Gr	7/4/1995	1615	Thunderstorm Winds	0kts.	0	0	8K	0
64 Warrenton	8/20/1995	1355	Thunderstorm Winds	0kts.	0	0	3K	0
65 ALZ001>050	10/4/1995	1200	Hurricane Opal/high Winds	N/A	2	0	0.1B	10.0M

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
66 ALZ001>018 - 020 - 022	1/18/1996	6:00 PM	High Wind	40kts.	0	0	400K	0
67 Arab	4/14/1996	9:00 PM	T'stm Wind	55kts.	0	0	75K	10K
68 Arab	4/20/1996	11:10 PM	T'stm Wind	56kts.	0	0	130K	2K
69 Arab	4/29/1996	3:05 PM	T'stm Wind/hail	50kts.	0	0	35K	4K
70 Boaz	7/7/1996	4:45 PM	T'stm Wind	50kts.	0	0	10K	0K
71 Arab	8/24/1996	2:10 PM	T'stm Wind	50kts.	0	0	15K	3K
72 Guntersville	8/24/1996	2:15 PM	T'stm Wind/hail	75kts.	0	0	15K	3K
73 Boaz	9/16/1996	4:30 PM	T'stm Wind	50kts.	0	0	8K	1K
74 Grant	9/16/1996	9:00 AM	T'stm Wind	55kts.	0	0	35K	5K
75 Douglas	1/24/1997	4:40 PM	T'stm Wind	50kts.	0	0	7K	1K
76 Douglas	1/24/1997	5:00 PM	T'stm Wind	50kts.	0	0	8K	1K
77 Arab	3/5/1997	2:35 PM	T'stm Wind	55kts.	0	0	20K	0K
78 Albertville	3/5/1997	3:00 PM	T'stm Wind	50kts.	0	0	10K	0K
79 Guntersville	3/5/1997	3:00 PM	T'stm Wind	0kts.	0	0	6K	0K
80 Albertville	5/28/1997	7:15 AM	T'stm Wind	50kts.	0	0	9K	0K
81 Union Grove	7/28/1997	2:45 PM	T'stm Wind	50kts.	0	0	7K	0K
82 Arab	7/28/1997	2:50 PM	T'stm Wind	50kts.	0	0	4K	0K
83 ALZ008	2/16/1998	3:30 AM	High Wind	39kts.	0	0	3K	0K
84 ALZ008 - 017 - 024>025 - 032>033 - 035 - 039	2/22/1998	11:00 AM	High Wind	44kts.	0	0	54K	0K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
85 Grant	3/19/1998	10:45 PM	T'stm Wind	55kts.	0	0	0K	0K
86 Guntersville	5/7/1998	5:45 AM	T'stm Wind	50kts.	0	0	10K	5K
87 Grant	5/26/1998	3:24 PM	T'stm Wind	55kts.	0	0	5K	10K
88 Countywide	6/5/1998	4:40 AM	T'stm Wind	55kts.	0	0	45K	10K
89 Arab	6/15/1998	9:00 PM	T'stm Wind	50kts.	0	0	20K	5K
90 Albertville	6/25/1998	3:55 PM	T'stm Wind	50kts.	0	0	5K	0K
91 Albertville	6/30/1998	4:30 PM	T'stm Wind	50kts.	0	0	5K	0K
92 Albertville	7/20/1998	2:50 PM	T'stm Wind	55kts.	0	0	10K	0K
93 Guntersville	7/23/1998	6:00 PM	T'stm Wind	50kts.	0	0	5K	0K
94 Boaz	7/24/1998	2:30 PM	T'stm Wind	50kts.	0	0	5K	0K
95 Horton	1/22/1999	7:37 PM	T'stm Wind	50kts.	0	0	0K	0K
96 Boaz	2/27/1999	7:45 PM	T'stm Wind	50kts.	0	0	0K	0K
97 Warrenton	4/19/1999	10:30 AM	T'stm Wind	50kts.	0	0	2K	0K
98 Albertville	6/2/1999	12:25 PM	T'stm Wind	50kts.	0	0	2K	0K
99 Arab	6/5/1999	2:10 AM	T'stm Wind	50kts.	0	0	5K	0K
100 Boaz	6/5/1999	2:20 AM	T'stm Wind	50kts.	0	0	2K	0K
101 Boaz	7/7/1999	5:30 PM	T'stm Wind	50kts.	0	0	5K	0K
102 Boaz	7/24/1999	12:30 PM	T'stm Wind	50kts.	0	0	5K	0K
103 Grant	8/19/1999	6:15 PM	T'stm Wind	55kts.	0	0	5K	0K
104 Boaz	2/13/2000	8:05 PM	T'stm Wind	65kts.	0	0	45K	0K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
105 Countywide	7/20/2000	4:20 PM	T'stm Wind	65kts.	0	0	70K	0K
106 Guntersville	8/10/2000	5:10 PM	T'stm Wind	50kts.	0	0	3K	0K
107 ALZ006>010 - 016>019 - 023>025 - 027	11/24/2000	3:00 PM	High Wind	50kts.	0	0	26K	0K
108 Countywide	2/16/2001	3:40 PM	T'stm Wind	55kts.	0	0	5K	0K
109 Grant	6/21/2001	7:08 PM	T'stm Wind	50kts.	0	0	3K	0K
110 Guntersville	7/3/2001	3:00 PM	T'stm Wind	50kts.	0	0	2K	0K
111 Countywide	7/5/2001	12:15 PM	T'stm Wind	55kts.	0	0	4K	0K
112 Union Grove	5/13/2002	10:57 AM	T'stm Wind	55kts.	0	0	5K	0K
113 Boaz	7/2/2002	3:19 PM	T'stm Wind	50kts.	0	0	3K	0K
114 Union Grove	8/2/2002	9:35 PM	T'stm Wind	55kts.	0	0	10K	0K
115 Boaz	8/20/2002	2:30 PM	T'stm Wind	60kts.	0	0	70K	0K
116 Arab	11/10/2002	9:45 PM	T'stm Wind	65kts.	0	0	125K	0K
117 Union Grove	2/22/2003	2:10 AM	T'stm Wind	60kts.	0	0	0	0
118 Claysville	3/19/2003	9:55 AM	T'stm Wind	60kts.	0	0	0	0
119 Boaz	5/2/2003	4:45 PM	T'stm Wind	60kts.	0	0	0	0
120 Albertville	5/5/2003	1:10 PM	T'stm Wind	50kts.	0	0	0	0
121 Albertville	5/5/2003	1:20 PM	T'stm Wind	60kts.	0	0	0	0
122 Albertville	5/5/2003	5:00 AM	T'stm Wind	60kts.	0	0	0	0
123 Albertville	5/5/2003	5:10 AM	T'stm Wind	50kts.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
124 Guntersville	5/5/2003	12:46 PM	T'stm Wind	50kts.	0	0	2K	0
125 Guntersville	6/11/2003	11:18 AM	T'stm Wind	50kts.	0	0	0	0
126 Arab	7/21/2003	3:27 PM	T'stm Wind	50kts.	0	0	0	0
127 Douglas	11/18/2003	1:54 PM	T'stm Wind	60kts.	0	0	0	0
128 Grant	6/22/2004	5:15 PM	T'stm Wind	50kts.	0	0	0	0
129 Boaz	7/6/2004	6:35 PM	T'stm Wind	50kts.	0	0	0	0
130 Arab	7/7/2004	4:07 PM	T'stm Wind	50kts.	0	0	0	0
131 Douglas	7/7/2004	4:45 PM	T'stm Wind	50kts.	0	0	0	0
132 Horton	7/7/2004	4:45 PM	T'stm Wind	50kts.	0	0	0	0
133 Guntersville	7/12/2004	1:05 PM	T'stm Wind	50kts.	0	0	0	0
134 Warrenton	7/12/2004	1:08 PM	T'stm Wind	50kts.	0	0	0	0
135 Guntersville	7/13/2004	11:10 PM	T'stm Wind	60kts.	0	0	0	0
136 Countywide	7/14/2004	3:20 PM	T'stm Wind	60kts.	0	0	0	0
137 Hustlerville	7/14/2004	6:05 PM	T'stm Wind	50kts.	0	0	5K	0
138 Arab	7/25/2004	3:40 PM	T'stm Wind	50kts.	0	0	0	0
139 ALZ001>010 - 016	9/16/2004	4:55 AM	High Wind	50kts.	0	3	2.5M	0
140 Arab	12/9/2004	7:55 AM	T'stm Wind	60kts.	0	0	0	0
141 Guntersville	12/9/2004	8:35 AM	T'stm Wind	60kts.	0	0	0	0
142 Albertville	12/9/2004	9:15 AM	T'stm Wind	60kts.	0	0	0	0
143 Grant	4/1/2005	4:50 PM	T'stm Wind	55kts.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
144 Grant	4/1/2005	4:55 PM	T'stm Wind	55kts.	0	0	0	0
145 Boaz	4/30/2005	3:20 AM	T'stm Wind	50kts.	0	0	0	0
146 Arab	7/27/2005	3:32 PM	T'stm Wind	50kts.	0	0	0	0
147 Albertville	8/12/2005	11:25 AM	T'stm Wind	50kts.	0	0	0	0
148 Arab	8/22/2005	3:07 PM	T'stm Wind	50kts.	0	0	0	0
149 Union Grove	11/15/2005	9:30 PM	T'stm Wind	60kts.	0	0	0	0
150 Arab	3/9/2006	5:34 PM	T'stm Wind	70kts.	0	0	1K	0
151 Union Grove	3/13/2006	6:35 PM	T'stm Wind	70kts.	0	0	5K	0
152 Hebron	4/3/2006	3:47 AM	T'stm Wind	60kts.	0	0	0	0
153 Guntersville	4/21/2006	4:45 PM	T'stm Wind	60kts.	0	0	0	0
154 Guntersville	4/21/2006	4:48 PM	T'stm Wind	60kts.	0	0	0	0
155 Guntersville	5/11/2006	8:45 PM	T'stm Wind	50kts.	0	0	0	0
156 Albertville	7/2/2006	3:15 PM	T'stm Wind	50kts.	0	0	0	0
157 Albertville	7/19/2006	1:10 PM	T'stm Wind	70kts.	0	0	20K	0
158 Arab	7/19/2006	1:10 PM	T'stm Wind	50kts.	0	0	0	0
159 Albertville	7/19/2006	12:35 PM	T'stm Wind	50kts.	0	0	0	0
160 Boaz	7/28/2006	2:05 PM	T'stm Wind	50kts.	0	0	0	0
161 Arab	9/22/2006	4:00 PM	T'stm Wind	50kts.	0	0	0	0
162 ALZ008	12/25/2006	12:00 AM	High Wind	50kts.	0	0	1K	0K
163 Little New York	4/3/2007	22:57 PM	Thunderstorm Wind	60kts.	0	0	0K	0K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
164 Swearengin	7/1/2007	13:40 PM	Thunderstorm Wind	50kts.	0	0	0K	0K
165 Grant	8/1/2007	16:28 PM	Thunderstorm Wind	50kts.	0	0	0K	0K
166 Guntersville Lake	8/1/2007	16:28 PM	Thunderstorm Wind	50kts.	0	0	0K	0K
167 Arab	8/10/2007	11:55 AM	Thunderstorm Wind	50kts.	0	0	0K	0K
168 Claysville	8/17/2007	14:02 PM	Thunderstorm Wind	50kts.	0	0	0K	0K
169 Guntersville	8/17/2007	14:38 PM	Thunderstorm Wind	50kts.	0	0	0K	0K
170 Oleander	8/17/2007	16:04 PM	Thunderstorm Wind	70kts.	0	0	0K	0K
171 Union Grove	8/17/2007	16:11 PM	Thunderstorm Wind	50kts.	0	0	0K	0K
172 Arab	8/17/2007	16:47 PM	Thunderstorm Wind	50kts.	0	0	0K	0K
173 Columbus City	1/10/2008	17:10 PM	Thunderstorm Wind	52kts.	0	0	0K	0K
174 Martling	1/10/2008	17:20 PM	Thunderstorm Wind	52kts.	0	0	0K	0K
175 Union Grove	1/10/2008	18:10 PM	Thunderstorm Wind	52kts.	0	0	0K	0K
176 ALZ006>008 - 016	1/29/2008	20:00 PM	High Wind	43kts.	0	0	10K	0K
177 Guntersville	2/6/2008	5:43 AM	Thunderstorm Wind	52kts.	0	0	1K	0K
178 Grant	4/11/2008	13:50 PM	Thunderstorm Wind	52kts.	0	0	0K	0K
179 Douglas	5/20/2008	16:15 PM	Thunderstorm Wind	52kts.	0	0	0K	0K
180 Whitesville	5/20/2008	16:15 PM	Thunderstorm Wind	61kts.	0	0	2K	0K
181 Guntersville	5/27/2008	16:22 PM	Thunderstorm Wind	52kts.	0	0	1K	0K
182 Grant	12/10/2008	1:10 AM	Thunderstorm Wind	50kts.	0	0	0K	1K
183 Guntersville	12/10/2008	1:10 AM	Thunderstorm Wind	50kts.	0	0	0K	1K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
184 GUNTERSVILLE MUNI AR	2/11/2009	13:05	Thunderstorm Wind	52kts. EG	0	0	1.00K	0.00K
185 LITTLE NEW YORK	3/28/2009	18:15	Thunderstorm Wind	60kts. EG	0	0	5.00K	0.00K
186 CROSSROADS	4/2/2009	20:35	Thunderstorm Wind	56kts. EG	0	0	5.00K	0.00K
187 ARAB	4/10/2009	4:30	Thunderstorm Wind	50kts. EG	0	0	5.00K	0.00K
188 ARAB	4/10/2009	4:30	Thunderstorm Wind	50kts. EG	0	0	0.00K	0.00K
189 MARSHALL (ZONE)	4/13/2009	1:00	High Wind	55kts. EG	0	0	600.00K	0.00K
190 COTTONVILLE	5/1/2009	16:35	Thunderstorm Wind	50kts. EG	0	0	2.00K	0.00K
191 RUTH	5/1/2009	17:20	Thunderstorm Wind	50kts. EG	0	0	2.00K	0.00K
192 ARAB	6/11/2009	9:51	Thunderstorm Wind	52kts. ES	0	0	50.00K	0.00K
193 RUTH	6/15/2009	19:10	Thunderstorm Wind	52kts. EG	0	0	4.00K	0.00K
194 HORTON	6/28/2009	15:44	Thunderstorm Wind	61kts. EG	0	0	8.00K	0.00K
195 HIGHPOINT	6/28/2009	15:45	Thunderstorm Wind	52kts. EG	0	0	0.00K	0.00K
196 ALBERTVILLE MUNI ARP	6/28/2009	15:50	Thunderstorm Wind	60kts. EG	0	0	0.00K	0.00K
197 ALBERTVILLE MUNI ARP	6/28/2009	15:55	Thunderstorm Wind	61kts. EG	0	0	0.00K	0.00K
198 NEEDMORE	6/28/2009	16:00	Thunderstorm Wind	50kts. EG	0	0	3.00K	0.00K
199 ARAB	7/12/2009	23:40	Thunderstorm Wind	56kts. EG	0	0	6.00K	0.00K
200 GUNTERSVILLE MUNI AR	7/12/2009	23:40	Thunderstorm Wind	56kts. EG	0	0	6.00K	0.00K
201 BOAZ	7/13/2009	0:00	Thunderstorm Wind	56kts. EG	0	0	6.00K	0.00K
202 MOUNTAINVIEW	7/30/2009	17:56	Thunderstorm Wind	52kts. EG	0	0	3.00K	0.00K
203 MARSHALL (ZONE)	12/2/2009	3:30	Strong Wind	43kts. EG	0	0	1.00K	0.00K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
204 RUTH	12/8/2009	22:10	Thunderstorm Wind	56kts. EG	0	0	50.00K	0.00K
205 MARSHALL (ZONE)	12/24/2009	17:00	High Wind	35kts. ES	0	0	0.00K	0.00K
206 MARTLING	3/12/2010	9:25	Thunderstorm Wind	50kts. EG	0	0	6.00K	0.00K
207 DOUGLAS	6/4/2010	13:24	Thunderstorm Wind	52kts. EG	0	0	20.00K	0.00K
208 LAKEVIEW	6/15/2010	12:52	Thunderstorm Wind	52kts. EG	0	0	8.00K	0.00K
209 UNION GROVE	6/15/2010	16:17	Thunderstorm Wind	52kts. EG	0	0	0.00K	0.00K
210 HENRYVILLE	6/19/2010	11:05	Thunderstorm Wind	52kts. EG	0	0	10.00K	0.00K
211 RUTH	7/25/2010	15:05	Thunderstorm Wind	50kts. EG	0	0	8.00K	0.00K
212 GUNTERSVILLE LAKE	7/26/2010	15:00	Thunderstorm Wind	50kts. EG	0	0	18.00K	0.00K
213 HYATT	8/6/2010	12:05	Thunderstorm Wind	65kts. EG	0	0	20.00K	0.00K
214 SWEARENGIN	8/6/2010	13:00	Thunderstorm Wind	65kts. EG	0	0	30.00K	0.00K
215 MOUNTAIN GAP	9/11/2010	15:50	Thunderstorm Wind	52kts. EG	0	0	0.00K	0.00K
216 BOAZ	9/21/2010	12:33	Thunderstorm Wind	52kts. EG	0	0	20.00K	0.00K
217 MOUNTAIN GAP	10/25/2010	2:25	Thunderstorm Wind	56kts. EG	0	0	5.00K	0.00K
218 MT CARMEL	10/25/2010	2:27	Thunderstorm Wind	56kts. EG	0	0	8.00K	0.00K
219 CLAYSVILLE	10/25/2010	2:28	Thunderstorm Wind	56kts. EG	0	0	20.00K	0.00K
220 GUNTERSVILLE MUNI AR	10/25/2010	2:30	Thunderstorm Wind	52kts. EG	0	0	2.00K	0.00K
221 POPLAR SPGS	10/25/2010	2:37	Thunderstorm Wind	52kts. EG	0	0	8.00K	0.00K
222 ALBERTVILLE	10/25/2010	3:07	Thunderstorm Wind	56kts. EG	0	0	20.00K	0.00K
223 LAKEVIEW	10/26/2010	16:27	Thunderstorm Wind	61kts. EG	0	0	40.00K	0.00K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
224 GUNTERSVILLE MUNI AR	10/26/2010	23:18	Thunderstorm Wind	74kts. EG	0	0	10.00K	0.00K
225 ARAB	2/24/2011	23:50	Thunderstorm Wind	52kts. EG	0	0	2.00K	0.00K
226 ARAB	2/28/2011	13:28	Thunderstorm Wind	52kts. EG	0	0	16.00K	0.00K
227 LAKEVIEW	2/28/2011	13:38	Thunderstorm Wind	52kts. EG	0	0	2.00K	0.00K
228 GUNTERSVILLE MUNI AR	2/28/2011	13:42	Thunderstorm Wind	52kts. EG	0	0	0.00K	0.00K
229 MT CARMEL	3/26/2011	18:57	Thunderstorm Wind	52kts. EG	0	0	2.00K	0.00K
230 LAKEVIEW	3/26/2011	18:58	Thunderstorm Wind	61kts. EG	0	0	10.00K	0.00K
231 ALBERTVILLE MUNI ARP	4/4/2011	18:15	Thunderstorm Wind	49kts. EG	0	0	0.10K	0.00K
232 UNION GROVE	4/11/2011	18:15	Thunderstorm Wind	52kts. EG	0	0	3.00K	0.00K
233 ARAB	4/11/2011	18:15	Thunderstorm Wind	52kts. EG	0	0	3.00K	0.00K
234 EDDY	4/20/2011	4:32	Thunderstorm Wind	50kts. EG	0	0	0.00K	0.00K
235 UNION GROVE	4/20/2011	4:35	Thunderstorm Wind	50kts. EG	0	0	0.00K	0.00K
236ARAB	4/20/2011	4:50	Thunderstorm Wind	50kts. EG	0	0	0.00K	0.00K
237 MARSHALL (ZONE)	4/20/2011	5:04	High Wind	52kts. MG	0	0	0.00K	0.00K
238 MARSHALL (ZONE)	4/20/2011	5:05	High Wind	50kts. EG	0	0	100.00K	0.00K
239 MARSHALL (ZONE)	4/20/2011	5:10	High Wind	50kts. EG	0	0	0.00K	0.00K
240 MARSHALL (ZONE)	4/20/2011	5:15	High Wind	50kts. EG	0	0	0.00K	0.00K
241 MARSHALL (ZONE)	4/20/2011	5:30	High Wind	50kts. EG	0	0	0.00K	0.00K
242 GUNTERSVILLE MUNI AR	4/20/2011	23:14	Thunderstorm Wind	40kts. EG	0	0	1.00K	0.00K
243 ARAB	4/20/2011	23:14	Thunderstorm Wind	40kts. EG	0	0	1.00K	0.00K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
244 WARRENTON	6/18/2011	14:07	Thunderstorm Wind	39kts. EG	0	0	2.00K	0.00K
245 LANE	6/18/2011	14:09	Thunderstorm Wind	39kts. EG	0	0	2.00K	0.00K
246 LITTLE NEW YORK	6/18/2011	14:14	Thunderstorm Wind	39kts. EG	0	0	2.00K	0.00K
247 DOUGLAS	6/21/2011	14:08	Thunderstorm Wind	52kts. EG	0	0	18.00K	0.00K
248 ARAB	6/21/2011	14:08	Thunderstorm Wind	58kts. EG	0	0	4.00K	0.00K
249 DOUGLAS	6/21/2011	14:10	Thunderstorm Wind	52kts. EG	0	0	5.00K	0.00K
250 NEIGHBORS MILL	6/21/2011	14:13	Thunderstorm Wind	52kts. EG	0	0	2.00K	0.00K
251 HYATT	6/21/2011	14:15	Thunderstorm Wind	52kts. EG	0	0	8.00K	0.00K
252 ARAB	6/21/2011	14:15	Thunderstorm Wind	52kts. EG	0	0	8.00K	0.00K
253 ARAB	6/21/2011	14:15	Thunderstorm Wind	52kts. EG	0	0	8.00K	0.00K
254 WARRENTON	6/21/2011	14:22	Thunderstorm Wind	43kts. EG	0	0	2.00K	0.00K
255 SCANT CITY	6/21/2011	14:25	Thunderstorm Wind	43kts. EG	0	0	2.00K	0.00K
256 ALBERTVILLE	6/21/2011	14:30	Thunderstorm Wind	48kts. EG	0	0	20.00K	0.00K
257 ALBERTVILLE	6/21/2011	14:40	Thunderstorm Wind	65kts. EG	0	0	20.00K	0.00K
258 WHITESVILLE	6/21/2011	14:45	Thunderstorm Wind	52kts. EG	0	0	8.00K	0.00K
259 LITTLE NEW YORK	6/21/2011	14:45	Thunderstorm Wind	52kts. EG	0	0	8.00K	0.00K
260 ARAB	6/21/2011	14:59	Thunderstorm Wind	50kts. EG	0	0	6.00K	0.00K
261 DOUGLAS	6/21/2011	15:02	Thunderstorm Wind	61kts. EG	0	0	10.00K	0.00K
262 DOUGLAS	6/21/2011	15:02	Thunderstorm Wind	50kts. EG	0	0	2.00K	0.00K
263 ARAB	6/21/2011	15:03	Thunderstorm Wind	50kts. EG	0	0	2.00K	0.00K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
264 NORTH ARAB	6/21/2011	15:03	Thunderstorm Wind	58kts. EG	0	0	2.00K	0.00K
265 RUTH	6/21/2011	15:03	Thunderstorm Wind	58kts. EG	0	0	2.00K	0.00K
266 ARAB	6/21/2011	15:03	Thunderstorm Wind	50kts. EG	0	0	2.00K	0.00K
267 EDDY	6/21/2011	15:05	Thunderstorm Wind	50kts. EG	0	0	2.00K	0.00K
268 MT CARMEL	6/21/2011	15:25	Thunderstorm Wind	50kts. EG	0	0	2.00K	0.00K
269 NORTH ARAB	6/21/2011	15:25	Thunderstorm Wind	50kts. EG	0	0	5.00K	0.00K
270 BOAZ	6/26/2011	14:00	Thunderstorm Wind	52kts. EG	0	0	2.00K	0.00K
271 BOAZ	6/26/2011	14:00	Thunderstorm Wind	52kts. EG	0	0	2.00K	0.00K
272 BOAZ	6/26/2011	14:01	Thunderstorm Wind	52kts. EG	0	0	2.00K	0.00K
273 HUSTLERVILLE	6/26/2011	14:11	Thunderstorm Wind	52kts. EG	0	0	2.00K	0.00K
274 CLAYSVILLE	6/28/2011	6:30	Thunderstorm Wind	43kts. EG	0	0	1.00K	0.00K
275 WARRENTON	7/4/2011	15:35	Thunderstorm Wind	43kts. EG	0	0	2.00K	0.00K
276 COLUMBUS CITY	7/4/2011	16:37	Thunderstorm Wind	43kts. EG	0	0	2.00K	0.00K
277 HYATT	7/12/2011	15:30	Thunderstorm Wind	52kts. EG	0	0	2.00K	0.00K
278 HORTON	8/3/2011	23:20	Thunderstorm Wind	45kts. EG	0	0	5.00K	0.00K
279 HEBRON	8/4/2011	0:20	Thunderstorm Wind	52kts. EG	0	0	75.00K	0.00K
280 MC VILLE	3/2/2012	21:17	Thunderstorm Wind	52kts. EG	0	0	10.00K	0.00K
281 HYATT	3/31/2012	16:35	Thunderstorm Wind	61kts. EG	0	0	2.00K	0.00K
282 CROSSROADS	5/29/2012	20:25	Thunderstorm Wind	35kts. EG	0	0	0.50K	0.00K
283 GUNTERSVILLE	7/1/2012	18:35	Thunderstorm Wind	78kts. EG	0	0	100.00K	0.00K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
284 GRANT	7/1/2012	19:03	Thunderstorm Wind	52kts. EG	0	0	20.00K	0.00K
285 GUNTERSVILLE	7/5/2012	19:49	Thunderstorm Wind	52kts. EG	0	0	10.00K	0.00K
286 GUNTERSVILLE	7/5/2012	20:05	Thunderstorm Wind	52kts. EG	0	0	20.00K	0.00K
287 ARAB	7/5/2012	20:25	Thunderstorm Wind	52kts. EG	0	0	20.00K	0.00K
288 MELTONSVILLE	7/16/2012	15:37	Thunderstorm Wind	52kts. EG	0	0	3.00K	0.00K
289 MARSHALL (ZONE)	12/25/2012	21:00	High Wind	35kts. ES	0	0	10.00K	0.00K
290 MARSHALL (ZONE)	2/25/2013	23:50	Strong Wind	43kts. EG	0	0	35.00K	0.00K
291 ALLEN XRDS	3/5/2013	13:11	Thunderstorm Wind	51kts. MG	0	0	0.00K	0.00K
292 GRANT	3/5/2013	13:13	Thunderstorm Wind	54kts. MG	0	0	0.00K	0.00K
293 GUNTERSVILLE MUNI AR	3/5/2013	13:30	Thunderstorm Wind	39kts. EG	0	0	1.00K	0.00K
294 ARAB	3/18/2013	14:23	Thunderstorm Wind	52kts. EG	0	0	20.00K	0.00K
295 GUNTERSVILLE	3/18/2013	14:30	Thunderstorm Wind	52kts. EG	0	0	20.00K	0.00K
296 ALBERTVILLE	3/18/2013	14:35	Thunderstorm Wind	87kts. EG	0	0	0.00K	0.00K
297 ALBERTVILLE	3/18/2013	14:35	Thunderstorm Wind	52kts. EG	0	0	25.00K	0.00K
298 RABBIT TOWN	3/18/2013	14:35	Thunderstorm Wind	70kts. EG	0	0	0.00K	0.00K
299 GRASSY	4/19/2013	1:20	Thunderstorm Wind	43kts. EG	0	0	0.50K	0.00K
300 BIG SPGS	6/1/2013	18:00	Thunderstorm Wind	43kts. EG	0	0	0.20K	0.00K
301 DOUGLAS	8/21/2013	16:36	Thunderstorm Wind	43kts. EG	0	0	10.00K	0.00K
302GUNTERSVILLE	9/2/2013	2:34	Thunderstorm Wind	52kts. EG	0	0	25.00K	0.00K
DOUGLAS	4/4/2014	535	Thunderstorm Wind	43kts. EG		0	0.00K	1000

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
RUTH	6/5/2014	1611	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
HYATT	6/5/2014	1616	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
GRANT	6/5/2014	1622	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
GRANT	6/5/2014	1622	Thunderstorm Wind	52kts. EG		0	0.00K	500
SCANT CITY	6/5/2014	1622	Thunderstorm Wind	52kts. EG		0	0.00K	500
ARAB	6/5/2014	1624	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
LITTLE NEW YORK	6/5/2014	1628	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
ARAB	6/5/2014	1635	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
ALBERTVILLE	6/7/2014	2100	Thunderstorm Wind	43kts. EG		0	0.00K	1000
MC VILLE	6/18/2014	1134	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
GUNTERSVILLE MUNI AR	6/18/2014	1145	Thunderstorm Wind	43kts. EG		0	0.00K	2000
GRASSY	6/18/2014	1707	Thunderstorm Wind	43kts. EG		0	0.00K	500
UNION GROVE	6/18/2014	1712	Thunderstorm Wind	43kts. EG		0	0.00K	500
ARAB	6/24/2014	1402	Thunderstorm Wind	43kts. EG		0	0.00K	1000
BIG SPGS	6/25/2014	1212	Thunderstorm Wind	35kts. EG		0	0.00K	500
RUTH	6/25/2014	1215	Thunderstorm Wind	35kts. EG		0	0.00K	500
MARTLING	6/25/2014	1300	Thunderstorm Wind	35kts. EG		0	0.00K	500
BOAZ	8/7/2014	1750	Thunderstorm Wind	65kts. EG		0	0.00K	150000
DOUGLAS	8/8/2014	1500	Thunderstorm Wind	43kts. EG		0	0.00K	1000
BOAZ	8/18/2014	1520	Thunderstorm Wind	52kts. EG		0	0.00K	3000
ARAB	10/3/2014	247	Thunderstorm Wind	52kts. EG		0	0.00K	10000
RABBIT TOWN	1/3/2015	1941	Thunderstorm Wind	74kts. EG		0	0.00K	0.00K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ALBERTVILLE	1/3/2015	1942	Thunderstorm Wind	61kts. EG		0	0.00K	0.00K
MARSHALL (ZONE)	4/10/2015		Thunderstorm				0.00K	0.00K
ALBERTVILLE	4/20/2015	152	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
GRANT	6/8/2015	1514	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
HORTON	6/26/2015	1455	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
MARSHALL (ZONE)	7/14/2015		Thunderstorm Wind					
GUNTERSVILLE MUNI AR	8/10/2015	1200	Thunderstorm Wind	30kts. EG		2	2	0
GUNTERSVILLE	8/10/2015	1515	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
ARAB	6/15/2016	1743	Thunderstorm Wind	43kts. EG		0	0.00K	500
EDDY	6/15/2016	1810	Thunderstorm Wind	43kts. EG		0	0.00K	1000
SCANT CITY	6/15/2016	1812	Thunderstorm Wind	43kts. EG		0	0.00K	500
HORTON	6/15/2016	1834	Thunderstorm Wind	43kts. EG		0	0.00K	500
HIGHPOINT	6/15/2016	1838	Thunderstorm Wind	43kts. EG		0	0.00K	1000
WHITESVILLE	6/15/2016	1845	Thunderstorm Wind	52kts. EG		0	0.00K	2000
COTTONVILLE	6/27/2016	1503	Thunderstorm Wind	43kts. EG		0	0.00K	500
LAKEVIEW	6/27/2016	1532	Thunderstorm Wind	43kts. EG		0	0.00K	500
MARSHALL (ZONE)	7/3/2016		Thunderstorm				0.00K	
MARSHALL (ZONE)	1/2/2017	2100	Strong Wind	30kts. EG		0	0.00K	1000
OLEANDER	3/1/2017	1443	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
SWEARENGIN	3/1/2017	1449	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
HENRYVILLE	3/1/2017	1452	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
HENRYVILLE	3/1/2017	1540	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
ARAB	3/10/2017	140	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DOUGLAS	3/27/2017	1806	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
ARAB	4/30/2017	1340	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
HEBRON	4/30/2017	1400	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
HYATT	4/30/2017	1405	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
HENRYVILLE	4/30/2017	1405	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
HENRYVILLE	4/30/2017	1405	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
CLAYSVILLE	4/30/2017	1405	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
ARAB	4/30/2017	1405	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
SARATOGA	4/30/2017	1405	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
ALBERTVILLE	4/30/2017	1407	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
HORTON	4/30/2017	1407	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
ALBERTVILLE	4/30/2017	1430	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
MT OLIVE	5/20/2017	1626	Thunderstorm Wind	43kts. EG		0	0.00K	200
ALLEN XRDS	5/20/2017	1629	Thunderstorm Wind	43kts. EG		0	0.00K	500
COTTONVILLE	5/23/2017	1457	Thunderstorm Wind	43kts. EG		0	0.00K	200
COLUMBUS CITY	5/23/2017	1513	Thunderstorm Wind	43kts. EG		0	0.00K	1000
GUNTERSVILLE LAKE	5/23/2017	1516	Thunderstorm Wind	43kts. EG		0	0.00K	200
COLUMBUS CITY	5/23/2017	1519	Thunderstorm Wind	43kts. EG		0	0.00K	200
GRASSY	6/15/2017	1311	Thunderstorm Wind	43kts. EG		0	0.00K	200
GRANT	6/15/2017	1317	Thunderstorm Wind	43kts. EG		0	0.00K	200
MOUNTAIN GAP	6/15/2017	1322	Thunderstorm Wind	43kts. EG		0	0.00K	200
MELTONSVILLE	6/15/2017	1325	Thunderstorm Wind	43kts. EG		0	0.00K	200

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
COTTONVILLE	6/15/2017	1330	Thunderstorm Wind	43kts. EG		0	0.00K	2000
DOUGLAS	6/15/2017	1335	Thunderstorm Wind	43kts. EG		0	0.00K	200
MELTONSVILLE	6/15/2017	1337	Thunderstorm Wind	43kts. EG		0	0.00K	200
DOUGLAS	6/15/2017	1350	Thunderstorm Wind	43kts. EG		0	1	200
LANE	6/22/2017	1440	Thunderstorm Wind	35kts. EG		0	0.00K	200
MARSHALL (ZONE)	9/11/2017	1600	High Wind	43kts. EG		0	0.00K	0.00K
SCANT CITY	9/19/2017	1258	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
LAKEVIEW	9/19/2017	1328	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
HYATT	9/19/2017	1328	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
MARSHALL (ZONE)	9/23/2017		Thunderstorm				0.00K	0.00K
ARAB	11/18/2017	1836	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
OLEANDER	11/18/2017	1836	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
GRANT	11/18/2017	1842	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
WARRENTON	11/18/2017	1848	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
GUNTERSVILLE LAKE	11/18/2017	1848	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
RED HILL	11/18/2017	1848	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
ARAB	4/3/2018	2200	Thunderstorm Wind	43kts. EG		0	0.00K	500
OLEANDER	4/3/2018	2200	Thunderstorm Wind	43kts. EG		0	0.00K	500
MT CARMEL	4/3/2018	2201	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
MT CARMEL	4/3/2018	2202	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
COLUMBUS CITY	4/3/2018	2208	Thunderstorm Wind	43kts. EG		0	0.00K	500
GRANT	4/3/2018	2208	Thunderstorm Wind	43kts. EG		0	0.00K	500
GRANT	4/3/2018	2210	Thunderstorm Wind	43kts. EG		0	0.00K	500

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
GUNTERSVILLE MUNI AR	4/3/2018	2211	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
LAKEVIEW	4/3/2018	2211	Thunderstorm Wind	43kts. EG		0	0.00K	500
SWEARENGIN	4/3/2018	2214	Thunderstorm Wind	43kts. EG		0	0.00K	500
BOAZ	4/3/2018	2230	Thunderstorm Wind	43kts. EG		0	0.00K	500
MELTONSVILLE	4/14/2018	1311	Thunderstorm Wind	78kts. EG		0	0.00K	0.00K
MARSHALL (ZONE)	4/22/2018	500	Strong Wind	43kts. EG		0	0.00K	10000
OLEANDER	6/1/2018	1051	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
UNION GROVE	6/1/2018	1053	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
NEIGHBORS MILL	6/1/2018	1057	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
MT CARMEL	6/1/2018	1103	Thunderstorm Wind	60kts. EG		0	0.00K	0.00K
KIRBYTOWN	6/1/2018	1114	Thunderstorm Wind	43kts. EG		0	0.00K	200
HUSTLERVILLE	6/1/2018	1119	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
LANE	6/1/2018	1121	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
HEBRON	6/1/2018	2040	Thunderstorm Wind	60kts. EG		0	0.00K	0.00K
BUCKSNORT	6/1/2018	2050	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
LAKEVIEW	6/11/2018	1800	Thunderstorm Wind	61kts. EG		0	0.00K	0.00K
DOUGLAS	6/11/2018	1900	Thunderstorm Wind	43kts. EG		0	0.00K	500
MARTLING	6/28/2018	1200	Thunderstorm Wind	43kts. EG		0	0.00K	100
COTTONVILLE	6/28/2018	1201	Thunderstorm Wind	43kts. EG		0	0.00K	100
WARRENTON	6/28/2018	1215	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
NEEDMORE	6/28/2018	1300	Thunderstorm Wind	43kts. EG		0	0.00K	200
MARTLING	8/8/2018	1559	Thunderstorm Wind	35kts. EG		0	0.00K	100

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
MC VILLE	8/8/2018	1703	Thunderstorm Wind	52kts. EG		0	0.00K	0.00K
WARRENTON	8/9/2018	1102	Thunderstorm Wind	43kts. EG		0	0.00K	200
UNION GROVE	11/1/2018	916	Thunderstorm Wind	43kts. EG		0	0.00K	200
HORTON	11/1/2018	953	Thunderstorm Wind	43kts. EG		0	0.00K	200
MARSHALL (ZONE)	12/8/2018	2100	Strong Wind	40kts. EG		0	0.00K	10000
MARSHALL (ZONE)	12/12/2018		High Wind; Rain					
OLEANDER	5/9/2019	1201	Thunderstorm Wind	61kts. EG		0	0.00K	0.00K
GUNTERSVILLE	5/9/2019		Thunderstorm Wind					
HYATT	6/20/2019	237	Thunderstorm Wind	43kts. EG		0	0.00K	200
SARATOGA	9/14/2019	1525	Thunderstorm Wind	43kts. EG		0	0.00K	500
TOTALS:					4	6	106.251M	31.302

Table E-3. Marshall County Lightning Events, 1994-2019

35 lightning events were reported in Marshall County, Alabama between 01/01/1994 and 12/31/2019.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Boaz	3/24/1994	1637	Lightning	N/A	0	0	5K	0
2 Guntersville	4/15/1994	930	Lightning	N/A	0	0	50K	0
3 Albertville	6/22/1994	1230	Lightning	N/A	0	0	5K	0
4 Brindlee Mountain	2/15/1995	1630	Lightning	N/A	0	1	5K	0
5 Boaz	7/15/1995	1321	Lightning	N/A	0	0	25K	0
6 Boaz	7/15/1995	1349	Lightning	N/A	0	0	8K	0
7 Boaz	8/6/1995	1710	Lightning	N/A	0	0	25K	0
8 Arab	4/29/1996	2:45 PM	Lightning	N/A	0	0	15K	0K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
9 Boaz	8/8/1996	3:00 PM	Lightning	N/A	0	0	15K	0K
10 Horton	6/14/1997	1:00 AM	Lightning	N/A	0	0	7K	0K
11 Arab	7/7/1998	5:30 PM	Lightning	N/A	0	0	30K	0K
12 Guntersville	2/9/1999	7:30 PM	Lightning	N/A	0	0	12K	0K
13 Guntersville	7/24/1999	2:40 PM	Lightning	N/A	0	0	5K	0K
14 Grant	6/25/2002	10:00 AM	Lightning	N/A	0	0	25K	0K
15 Albertville	4/3/2006	3:57 AM	Lightning	N/A	0	0	2K	0
HEBRON	3/4/2008	4:00	Lightning		0	0	75.00K	0.00K
UNION GROVE	6/28/2009	16:30	Lightning		0	0	0.50K	0.00K
COTTONVILLE	7/25/2010	15:30	Lightning		1	4	0.00K	0.00K
LAKEVIEW	10/26/2010	16:46	Lightning		0	1	0.00K	0.00K
WHITESVILLE	4/11/2011	18:15	Lightning		0	0	1.00K	0.00K
GRANT	4/11/2011	18:15	Lightning		0	0	1.00K	0.00K
ALBERTVILLE	4/11/2011	18:15	Lightning		0	0	1.00K	0.00K
DOUGLAS	4/11/2011	18:15	Lightning		0	0	1.00K	0.00K
SCANT CITY	6/21/2011	14:25	Lightning		0	0	1.00K	0.00K
MOUNTAINVIEW	3/5/2013	13:30	Lightning		0	0	1.00K	0.00K
ALBERTVILLE	8/2/2013	7:30	Lightning		0	0	15.00K	0.00K
ALBERTVILLE	8/10/2013	13:10	Lightning		0	1	0.00K	0.00K
TOTALS:					1	7	330.5	0.00K

Source: National Climatic Data Center

Table E-4. Marshall County Hail Events, 1967-2019

174 hail events were reported in Marshall County, Alabama between 01/01/1967 and 06/12/2019.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 MARSHALL	5/12/1967	950	Hail	0.75 in.	0	0	0	0
2 MARSHALL	4/14/1968	1730	Hail	2.00 in.	0	0	0	0
3 MARSHALL	1/28/1974	815	Hail	0.75 in.	0	0	0	0
4 MARSHALL	3/7/1975	1340	Hail	2.75 in.	0	0	0	0
5 MARSHALL	5/8/1975	2148	Hail	0.75 in.	0	0	0	0
6 MARSHALL	2/22/1983	1500	Hail	2.75 in.	0	0	0	0
7 MARSHALL	5/2/1984	1410	Hail	1.75 in.	0	0	0	0
8 MARSHALL	7/31/1986	1332	Hail	2.75 in.	0	0	0	0
9 MARSHALL	3/5/1989	1423	Hail	2.00 in.	0	0	0	0
10 MARSHALL	4/4/1989	420	Hail	1.00 in.	0	0	0	0
11 MARSHALL	4/4/1989	1000	Hail	0.75 in.	0	0	0	0
12 MARSHALL	4/4/1989	1035	Hail	0.75 in.	0	0	0	0
13 MARSHALL	5/3/1990	1820	Hail	1.00 in.	0	0	0	0
14 MARSHALL	3/6/1992	1522	Hail	1.00 in.	0	0	0	0
15 MARSHALL	10/10/1992	1442	Hail	1.00 in.	0	0	0	0
16 Arab; Martling & Pop.	4/15/1994	915	Hail	1 kts.	0	0	5K	0
17 Grant	6/26/1994	2226	Hail	0.75 in.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
18 Black Island	6/26/1994	2248	Hail	0.75 in.	0	0	0	0
19 Beulah	1/28/1995	1555	Hail	0.75 in.	0	0	0	0
20 Arab	3/15/1996	1:42 PM	Hail	0.75 in.	0	0	12K	0
21 Arab	4/29/1996	3:05 PM	Hail	50 kts.	0	0	35K	4K
22 Guntersville	8/24/1996	2:15 PM	Hail	75 kts.	0	0	15K	3K
23 Arab	1/24/1997	4:20 PM	Hail	1.50 in.	0	0	8K	2K
24 Albertville	1/24/1997	4:49 PM	Hail	0.75 in.	0	0	7K	0K
25 Guntersville	1/24/1997	5:00 PM	Hail	1.75 in.	0	0	10K	3K
26 Douglas	4/28/1997	3:45 PM	Hail	1.00 in.	0	0	5K	0K
27 Albertville	4/28/1997	5:28 PM	Hail	0.75 in.	0	0	3K	0K
28 Guntersville	5/2/1997	6:48 PM	Hail	1.75 in.	0	0	15K	5K
29 Arab	3/19/1998	10:58 PM	Hail	0.75 in.	0	0	0K	0K
30 Union Grove	4/3/1998	5:18 PM	Hail	0.75 in.	0	0	0K	0K
31 Albertville	4/3/1998	5:55 PM	Hail	0.75 in.	0	0	0K	0K
32 Arab	4/8/1998	6:37 PM	Hail	0.75 in.	0	0	0K	0K
33 Arab	4/8/1998	6:45 PM	Hail	2.75 in.	0	0	50K	20K
34 Arab	4/8/1998	6:52 PM	Hail	2.75 in.	0	0	55K	18K
35 Guntersville	4/8/1998	6:59 PM	Hail	1.75 in.	0	0	10K	5K
36 Albertville	4/8/1998	7:11 PM	Hail	0.88 in.	0	0	0K	0K
37 Albertville	4/8/1998	7:14 PM	Hail	1.75 in.	0	0	20K	10K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
38 Horton	4/16/1998	9:40 PM	Hail	0.75 in.	0	0	0K	0K
39 Boaz	2/27/1999	7:45 PM	Hail	0.88 in.	0	0	0K	0K
40 Highpoint	4/19/1999	10:30 AM	Hail	0.88 in.	0	0	0K	0K
41 Grant	5/5/1999	11:40 PM	Hail	1.00 in.	0	0	3K	0K
42 Arab	2/13/2000	7:45 PM	Hail	1.00 in.	0	0	2K	0K
43 Guntersville	4/27/2000	7:10 PM	Hail	1.00 in.	0	0	2K	0K
44 Arab	7/26/2000	2:57 PM	Hail	0.75 in.	0	0	0K	0K
45 Arab	5/28/2001	4:35 PM	Hail	1.00 in.	0	0	0K	0K
46 Arab	6/26/2001	2:25 PM	Hail	1.75 in.	0	0	2K	0K
47 Albertville	11/24/2001	1:45 PM	Hail	0.75 in.	0	0	0K	0K
48 Horton	5/3/2002	11:40 AM	Hail	1.00 in.	0	0	0K	0K
49 Highpoint	7/2/2002	3:19 PM	Hail	0.75 in.	0	0	0K	0K
50 Guntersville	8/20/2002	2:13 PM	Hail	1.00 in.	0	0	0K	0K
51 Arab	8/26/2002	3:35 PM	Hail	0.75 in.	0	0	0K	0K
52 Grant	2/22/2003	4:05 AM	Hail	0.75 in.	0	0	0	0
53 Albertville	3/19/2003	12:15 PM	Hail	0.75 in.	0	0	0	0
54 Albertville	3/19/2003	12:27 PM	Hail	0.75 in.	0	0	0	0
55 Albertville	3/19/2003	12:38 PM	Hail	0.75 in.	0	0	0	0
56 Guntersville	4/25/2003	4:05 PM	Hail	1.00 in.	0	0	0	0
57 Albertville	4/25/2003	4:15 PM	Hail	1.00 in.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
58 Albertville	5/2/2003	1:30 PM	Hail	1.75 in.	0	0	0	0
59 Arab	5/2/2003	1:30 PM	Hail	1.75 in.	0	0	0	0
60 Arab	5/2/2003	1:55 PM	Hail	1.75 in.	0	0	0	0
61 Guntersville	5/2/2003	2:05 PM	Hail	1.00 in.	0	0	0	0
62 Horton	5/2/2003	2:15 PM	Hail	0.88 in.	0	0	0	0
63 Arab	5/2/2003	3:40 PM	Hail	0.75 in.	0	0	0	0
64 Albertville	5/2/2003	4:22 PM	Hail	0.75 in.	0	0	0	0
65 Boaz	5/2/2003	4:23 PM	Hail	0.75 in.	0	0	0	0
66 Albertville	5/2/2003	4:30 PM	Hail	1.00 in.	0	0	0	0
67 Boaz	5/2/2003	4:30 PM	Hail	1.00 in.	0	0	0	0
68 Guntersville	5/5/2003	12:46 PM	Hail	0.88 in.	0	0	0	0
69 Albertville	5/5/2003	12:50 PM	Hail	0.75 in.	0	0	0	0
70 Union Grove	3/30/2004	2:30 PM	Hail	0.75 in.	0	0	0	0
71 Guntersville	7/13/2004	11:30 PM	Hail	0.75 in.	0	0	0	0
72 Union Grove	2/21/2005	6:43 PM	Hail	0.75 in.	0	0	0	0
73 Arab	2/21/2005	6:49 PM	Hail	0.75 in.	0	0	0	0
74 Scant City	2/21/2005	6:49 PM	Hail	0.88 in.	0	0	0	0
75 Albertville	2/21/2005	7:42 PM	Hail	0.88 in.	0	0	0	0
76 Douglas	2/21/2005	8:10 PM	Hail	0.88 in.	0	0	0	0
77 Grant	4/7/2005	1:36 PM	Hail	0.75 in.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
78 Guntersville	4/22/2005	5:39 PM	Hail	1.25 in.	0	0	0	0
79 Arab	6/20/2005	6:40 PM	Hail	1.00 in.	0	0	0	0
80 Union Grove	12/4/2005	2:00 AM	Hail	0.75 in.	0	0	0	0
81 Union Grove	4/7/2006	10:22 PM	Hail	1.75 in.	0	0	15K	0
82 Grant	4/7/2006	10:32 PM	Hail	1.75 in.	0	0	20K	0
83 Albertville	4/18/2006	4:15 PM	Hail	1.00 in.	0	0	0	0
84 Boaz	4/18/2006	4:50 PM	Hail	1.00 in.	0	0	0	0
85 Albertville	4/19/2006	4:19 PM	Hail	0.88 in.	0	0	0	0
86 Albertville	4/19/2006	4:21 PM	Hail	1.00 in.	0	0	0	0
87 Mc Ville	4/19/2006	4:25 PM	Hail	1.00 in.	0	0	0	0
88 Boaz	4/19/2006	4:30 PM	Hail	1.00 in.	0	0	0	0
89 Boaz	4/19/2006	4:44 PM	Hail	1.25 in.	0	0	0	0
90 Arab	4/20/2006	2:40 PM	Hail	0.75 in.	0	0	0	0
91 Union Grove	4/20/2006	5:08 PM	Hail	1.00 in.	0	0	0	0
92 Arab	4/20/2006	5:09 PM	Hail	1.75 in.	0	0	0	0
93 Arab	4/21/2006	2:30 AM	Hail	1.75 in.	0	0	0	0
94 Grant	4/21/2006	3:50 AM	Hail	0.88 in.	0	0	0	0
95 Grant	5/13/2006	8:55 PM	Hail	0.88 in.	0	0	0	0
96 Douglas	6/22/2006	5:26 PM	Hail	0.88 in.	0	0	0	0
97 Albertville	5/3/2007	13:35 PM	Hail	0.75 in.	0	0	0K	0K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
98 Union Grove	4/11/2008	13:20 PM	Hail	1.75 in.	0	0	0K	0K
99 Grant	4/11/2008	13:40 PM	Hail	0.88 in.	0	0	0K	0K
100 Union Grove	4/11/2008	13:40 PM	Hail	1.00 in.	0	0	0K	0K
101 Saratoga	6/1/2008	14:59 PM	Hail	0.75 in.	0	0	0K	0K
102 Highpoint	6/1/2008	15:00 PM	Hail	1.00 in.	0	0	0K	0K
104 Arab	12/10/2008	1:10 AM	Hail	0.88 in.	0	0	0K	0K
105 GUNTERSVILLE MUNI AR	3/28/2009	18:10	Hail	1.00 in.	0	0	0.00K	0.00K
106 MOUNTAINVIEW	3/28/2009	18:12	Hail	1.25 in.	0	0	0.00K	0.00K
107 GUNTERSVILLE MUNI AR	3/28/2009	18:12	Hail	0.88 in.	0	0	0.00K	0.00K
108 ARAB	4/10/2009	4:20	Hail	0.88 in.	0	0	0.00K	0.00K
109 ALLEN XRDS	4/10/2009	13:30	Hail	0.75 in.	0	0	0.00K	0.00K
110 GRANT	4/10/2009	13:50	Hail	2.75 in.	0	0	0.00K	0.00K
111 SWEARENGIN	4/10/2009	13:55	Hail	2.00 in.	0	1	0.00K	0.00K
112 GUNTERSVILLE LAKE	4/10/2009	14:03	Hail	2.75 in.	0	0	0.00K	0.00K
113 ARAB	4/10/2009	14:26	Hail	0.88 in.	0	0	0.00K	0.00K
114 MT CARMEL	4/10/2009	14:35	Hail	1.00 in.	0	0	0.00K	0.00K
115 GUNTERSVILLE MUNI AR	4/10/2009	14:36	Hail	2.00 in.	0	0	0.00K	0.00K
116 COTTONVILLE	4/10/2009	14:38	Hail	2.00 in.	0	0	0.00K	0.00K
117 HYATT	4/10/2009	14:55	Hail	1.50 in.	0	0	0.00K	0.00K
118 HUSTLERVILLE	4/10/2009	15:05	Hail	1.25 in.	0	0	0.00K	0.00K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
119 ALBERTVILLE MUNI ARP	4/10/2009	15:21	Hail	1.00 in.	0	0	0.00K	0.00K
120 SARATOGA	4/10/2009	15:26	Hail	1.75 in.	0	0	0.00K	0.00K
121 ALBERTVILLE	4/19/2009	19:21	Hail	0.88 in.	0	0	0.00K	0.00K
122 ALBERTVILLE	4/19/2009	19:24	Hail	0.88 in.	0	0	0.00K	0.00K
123 HENRYVILLE	5/1/2009	17:04	Hail	0.88 in.	0	0	0.00K	0.00K
124 GUNTERSVILLE MUNI AR	3/12/2010	9:09	Hail	0.75 in.	0	0	0.00K	0.00K
125 MARTLING	3/12/2010	9:25	Hail	1.75 in.	0	0	50.00K	0.00K
126 NORTH ARAB	3/25/2010	18:56	Hail	0.88 in.	0	0	0.00K	0.00K
127 ARAB	10/24/2010	21:50	Hail	1.00 in.	0	0	0.00K	0.00K
128 UNION GROVE	3/26/2011	18:56	Hail	1.00 in.	0	0	0.00K	0.00K
129 UNION GROVE	3/26/2011	18:59	Hail	1.75 in.	0	0	0.00K	0.00K
130 ALBERTVILLE	3/26/2011	19:25	Hail	0.75 in.	0	0	0.00K	0.00K
131 HEBRON	4/11/2011	18:27	Hail	1.75 in.	0	0	0.00K	0.00K
132 GRANT	6/15/2011	13:03	Hail	0.88 in.	0	0	0.00K	0.00K
133 GRANT	6/15/2011	13:04	Hail	1.00 in.	0	0	0.00K	0.00K
134 LAKEVIEW	6/24/2011	15:40	Hail	0.88 in.	0	0	0.00K	0.00K
135 ALLEN XRDS	7/4/2011	16:30	Hail	0.88 in.	0	0	0.00K	0.00K
136 GRANT	8/4/2011	10:20	Hail	1.75 in.	0	0	5.00K	0.00K
137 DOUGLAS	3/2/2012	18:49	Hail	1.00 in.	0	0	0.00K	0.00K
138 DOUGLAS	3/2/2012	18:58	Hail	1.00 in.	0	0	0.00K	0.00K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
139 ALBERTVILLE MUNI ARP	3/2/2012	21:12	Hail	0.88 in.	0	0	0.00K	0.00K
140 ARAB	3/31/2012	16:15	Hail	1.00 in.	0	0	0.00K	0.00K
141 ARAB	3/31/2012	16:28	Hail	1.00 in.	0	0	0.00K	0.00K
142 GUNTERSVILLE	4/5/2012	17:45	Hail	0.88 in.	0	0	0.00K	0.00K
143 GRANT	4/5/2012	18:20	Hail	1.75 in.	0	0	0.00K	0.00K
144 GUNTERSVILLE	4/5/2012	18:50	Hail	0.88 in.	0	0	0.00K	0.00K
146 BOAZ	6/7/2013	11:25	Hail	0.75 in.	0	0	0.00K	0.00K
147 BOAZ	6/7/2013	11:25	Hail	0.75 in.	0	0	0.00K	0.00K
148 BOAZ	6/13/2013	11:25	Hail	0.75 in.	0	0	0.00K	0.00K
ALBERTVILLE	10/12/2014	1507	Hail	1 in	0	0	0.00K	0.00K
ALLEN XRDS	3/31/2015	1322	Hail	0.75 in	0	0	0.00K	0.00K
GRANT	3/31/2015	1352	Hail	1 in	0	0	0.00K	0.00K
GRANT	3/31/2015	1430	Hail	1.75 in	0	0	0.00K	0.00K
DOUGLAS	3/31/2015	1636	Hail	1 in	0	0	0.00K	0.00K
ALBERTVILLE	3/31/2015	1713	Hail	0.88 in	0	0	0.00K	0.00K
UNION GROVE	3/31/2015	1726	Hail	1 in	0	0	0.00K	0.00K
ARAB	3/31/2015	1730	Hail	1 in	0	0	0.00K	0.00K
GRANT	6/8/2015	1514	Hail	1 in	0	0	0.00K	0.00K
HEBRON	3/1/2017	1420	Hail	1 in	0	0	0.00K	0.00K
GUNTERSVILLE MUNI AR	3/1/2017	1430	Hail	1.75 in	0	0	0.00K	0.00K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
HENRYVILLE	3/1/2017	1430	Hail	1 in	0	0	0.00K	0.00K
GUNTERSVILLE	3/21/2017	1729	Hail	1 in	0	0	0.00K	0.00K
CROSSROADS	3/27/2017	1341	Hail	1.25 in	0	0	0.00K	0.00K
GUNTERSVILLE	3/27/2017	1341	Hail	1.75 in	0	0	0.00K	0.00K
DOUGLAS	3/27/2017	1801	Hail	0.88 in	0	0	0.00K	0.00K
BOAZ	3/27/2017	1810	Hail	1 in	0	0	0.00K	0.00K
HORTON	4/5/2017	1652	Hail	0.88 in	0	0	0.00K	0.00K
CLAYSVILLE	4/5/2017	1707	Hail	0.88 in	0	0	0.00K	0.00K
ARAB	3/19/2018	1807	Hail	1 in	0	0	0.00K	0.00K
ARAB	3/19/2018	1816	Hail	1.75 in	0	0	0.00K	0.00K
CROSSROADS	3/19/2018	1819	Hail	1 in	0	0	0.00K	0.00K
BOAZ	3/19/2018	1830	Hail	1.75 in	0	0	0.00K	0.00K
HYATT	5/15/2018	1658	Hail	1 in	0	0	0.00K	0.00K
MT CARMEL	8/29/2018	1645	Hail	1 in	0	0	0.00K	0.00K
ALBERTVILLE	6/12/2019	1439	Hail	1 in	0	0	0.00K	0.00K
TOTALS:						1	349.00K	70.00K

Source: National Climatic Data Center

Table E-5. Marshall County Tornado Events, 2009-2019

31 tornadoes were reported in Marshall County, Alabama between 01/01/2009 and 05/09/2019.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
37 LITTLE NEW YORK	4/10/2009	4:38	Tornado	EF0	0	0	16.00K	0.00K
38 GRANT	4/10/2009	14:02	Tornado	EF3	0	5	0.00K	0.00K
39 LITTLE NEW YORK	4/19/2009	19:35	Tornado	EF1	1	1	0.00K	0.00K
40 MT OLIVE	5/3/2009	14:40	Tornado	EF1	0	0	20.00K	0.00K
41 ALBERTVILLE MUNI ARP	6/28/2009	15:50	Tornado	EF0	0	0	18.00K	0.00K
42 NIXON CHAPEL	4/24/2010	21:05	Tornado	EF3	0	35	14.000M	0.00K
43 NORTH ARAB	10/25/2010	2:23	Tornado	EF0	0	0	35.00K	0.00K
44 MC VILLE	10/26/2010	17:13	Tornado	EF0	0	0	5.00K	0.00K
45 NIXON CHAPEL	4/27/2011	5:22	Tornado	EF1	0	0	40.00K	0.00K
46 RED HILL	4/27/2011	5:22	Tornado	EF1	0	0	0.00K	0.00K
47 RED HILL	4/27/2011	5:24	Tornado	EF1	0	0	0.00K	0.00K
48 WARRENTON	4/27/2011	5:30	Tornado	EF2	0	0	0.00K	0.00K
49 HYATT	4/27/2011	5:30	Tornado	EF1	0	0	0.00K	0.00K
50 HIGHPOINT	4/27/2011	5:30	Tornado	EF1	0	0	0.00K	0.00K
51 HIGHPOINT	4/27/2011	5:30	Tornado	EF1	0	0	0.00K	0.00K
52 GRANT	4/27/2011	5:35	Tornado	EF1	0	0	10.00K	0.00K
53 BIG SPGS	4/27/2011	5:35	Tornado	EF1	0	0	0.00K	0.00K
54 HENRYVILLE	4/27/2011	5:43	Tornado	EF0	0	0	0.00K	0.00K
55 MARTLING	4/27/2011	5:45	Tornado	EF1	0	0	0.00K	0.00K
56 GUNTERSVILLE MUNI AR	4/27/2011	5:45	Tornado	EF1	0	0	0.00K	0.00K
57 GUNTERSVILLE LAKE	4/27/2011	5:49	Tornado	EF1	0	0	0.00K	0.00K
58 RUTH	4/27/2011	14:16	Tornado	EF4	5	48	0.00K	0.00K
59 RED HILL	4/27/2011	16:50	Tornado	EF2	0	0	0.00K	0.00K
60 MC VILLE	3/18/2013	14:41	Tornado	EF1	0	0	0.00K	0.00K
61 BOAZ	3/18/2013	14:41	Tornado	EF0	0	0	0.00K	0.00K
POPLAR SPGS	10/3/2014	302	Tornado	EF0	0	0	0	0.00K
OLEANDER	11/29/2016	2305	Tornado	EF1	0	0	0	0.00K
ARAB	8/31/2017	2017	Tornado	EF1	0	0	0	0.00K
HORTON	3/19/2018	1826	Tornado	EF2	0	0	0	0.00K
HYATT	4/8/2019	610	Tornado	EF1	0	1	0	0.00K
MC VILLE	5/9/2019	1230	Tornado	EF1	0	0	0	0.00K
TOTALS					6	90	158.00K	0.00K

Source: National Climatic Data Center

Table E-6. Marshall County Tornadoes, 2014-2019 (NWS)

Date and Start Time	County(ies)	F-scale	Path Width (feet)	Path Length (miles)	Fatalities	Injuries	Description
10/3/2014 302	MARSHALL	F0	75	0.48	0	0	A brief tornado touched down off Martling Road near Jolie Lane destroying one chicken house and severely damaging another . Much of the debris was thrown to the north-northwest suggesting the wind flow was circular and convergent in nature. Just northeast, several trees were snapped west of Martling Road. At the intersection of Martling Road and Burgess Road, six to eight pine trees were snapped near the base and a house sustained some roof and siding damage. Based on the structural damage to the chicken house and the snapped pines, the maximum winds were determined to be around 95 mph.
11/29/2016 2305	MARSHALL	F1	1.2	50	0	0	A tornado developed near Union Grove Road and Tinner Mayo Road intersection in the Union Grove Community. As it developed multiple trees were snapped and uprooted causing minor roof damage to one single family home. More significant home damage was sustained to another nearby single family house due to trees snapping and falling on the roof. As the tornado proceeded northeast to Tinner Mayo Road, it flipped a recreational vehicle and moved it into a single family home causing damage to the home and destroying the recreational vehicle. Meanwhile, the tornado caused shingles to come off the roof of this single family house. Further to the northeast, the tornado uplifted the roof of a storage shed for hay and caused minor roof damage to a double wide manufactured home.

Date and Start Time	County(ies)	F-scale	Path Width (feet)	Path Length (miles)	Fatalities	Injuries	Description
8/31/2017 1958	Cullman-MARSHALL	F2	13.63	300	0	0	A tornado developed just south of Holly Pond, Alabama near the intersection of Highway 91 and CR 695 where a couple of trees were uprooted. As the tornado moved northeast it crossed Highway 278 where more trees were snapped and uprooted, and then struck 10 chicken houses. It destroyed nearly all of the chicken houses producing damage consistent with a low end EF-2. Metal roofing from these chicken houses was spread across a large area several hundred yards in width. Additional roof shingle damage also occurred to a family residence along with several snapped and uprooted trees just to the northeast of these chicken houses along CR 1728. The tornado was produced by the remnants of Hurricane Harvey.
3/19/2018 1826	MARSHALL	F2	690	3.76	0	0	The Horton Tornado in Southern MARSHALL County was associated with the long lived parent supercell that migrated eastward from the AL/MS state line. The damage assessment team, consisting of NWS Huntsville and MARSHALL County EMA, noted the beginning of the damage west of Old Oneota Rd and Dixie Dale Rd. Numerous trees were either snapped or uprooted along and adjacent to Old Oneota Rd, indicative of 90 mph. More significant damage was noted on the west side of Ole Oneota Rd were two chicken houses and a barn were destroyed. The team determined winds to be 112 mph, or a low-end EF- 2. The second set of chicken houses destroyed occurred near Oneota Cutoff Rd, however these were not as heavily as damaged. As the tornado tracked due east toward Hwy 75 , he most prevalent damage was snapped or uprooted trees. On the west side of Hwy 75, damage was noted to a weak farm building. Damage was not observed on the east side of the Hwy or at Albertville Regional Airport. However, numerous snapped or uprooted trees were observed along White Oak Road and east toward Whitesville Rd. Structure damage was recorded on Whitesville Rd to a third set of chicken houses, but the damage was downgraded due to the fact the doors were open. The tornado was estimated to lift just east of Whitesville Rd before Walnut St.

Date and Start Time	County(ies)	F-scale	Path Width (feet)	Path Length (miles)	Fatalities	Injuries	Description
5/9/2019 1230	MARSHALL	F1	25	0.48	0	0	The first evidence of damage occurred with a snapped tree near a bend at Gaines Circle. The tornado caused minor damage to three barns or sheds. A number of pine trees were snapped near the intersection of Gaines Circle and Gaines Drive. Additional trees were snapped along Gaines Circle before the intersection with Old McVille Road. No further damage was observable east of Old McVille Rd past the MARSHALL and DeKalb Co line.
4/8/2019 610	MARSHALL	F1	219	6.1	0	1	The MARSHALL Co. team tracked the initial touchdown of the tornado SW of the intersection of Highpoint Rd/McAllister Rd and north of Bearden Rd. Numerous hardwood trees were either uprooted or had large limb damage. As the tornado approached Highpoint Rd, it caused minor roof damage to two single family homes and destroyed a large shed, that was unanchored to its foundation. Damage indicators further upstream were consistent with the assessment at Highpoint Rd. A mix of hardwood and softwood trees were either snapped or uprooted along portions of Nixon Chapel Rd and Section Line Rd. A more concentrated area of heavy tree damage, with significant mobile home roof damage and minor single home roof damage, was noted in an area between Windsor Rd and Mt. Olive Rd, likely where the tornado peaked in intensity. The tornado continued NNE toward Hwy 431. The tornado started to quickly weaken as it crossed the Oneonta Cutoff Rd/Turnpike Rd/CR 205 junction. Sporadic tree damage was observed around this location, causing power line damage. Finally, the tornado approached Hwy 431 and damaged AC units and caused minor roof damage to two large retail buildings. Very minor limb damage was noted north of 431 where the tornado dissipated.

Source: National Weather Service

Table E-7. Marshall County Flood Events, 1997-2019

54 flood event s were reported in Marshall County, Alabama between 01/01/1997 and 12/31/2019.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Arab	1/5/1997	1:05 AM	Flash Flood	N/A	0	0	5K	2K
2 Guntersville	5/2/1997	8:00 PM	Flash Flood	N/A	0	0	40K	5K
3 Albertville	6/17/1997	9:00 AM	Flash Flood	N/A	0	0	12K	0K
4 Countywide	1/7/1998	9:30 AM	Flash Flood	N/A	0	0	50K	5K
5 Boaz	6/28/1999	2:00 AM	Flash Flood	N/A	0	0	8K	0K
6 Countywide	4/3/2000	12:00 PM	Flash Flood	N/A	0	0	10K	0K
7 Arab	7/5/2001	12:30 PM	Flash Flood	N/A	0	0	3K	0K
8 Countywide	8/10/2001	8:00 AM	Flash Flood	N/A	0	4	100K	0K
9 Countywide	2/22/2003	6:45 AM	Flash Flood	N/A	0	0	0	0
10 Countywide	2/22/2003	9:46 AM	Flash Flood	N/A	0	0	0	0
11 Countywide	5/6/2003	10:00 AM	Flash Flood	N/A	0	0	250K	0
12 Douglas	6/17/2003	4:00 PM	Flash Flood	N/A	0	0	0	0
13 Claysville	6/19/2003	4:30 PM	Flash Flood	N/A	0	0	0	0
14 ALZ001 - 004 - 008 - 010 - 010	2/6/2004	1:00 AM	Flood	N/A	0	0	0	0
15 Arab	3/5/2004	11:05 PM	Flash Flood	N/A	0	0	0	0
16 Guntersville	3/5/2004	11:05 PM	Flash Flood	N/A	0	0	0	0
17 Countywide	9/16/2004	4:36 PM	Flash Flood	N/A	0	0	0	0
18 Guntersville	10/19/2004	2:25 PM	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
19 Countywide	12/9/2004	9:45 AM	Flash Flood	N/A	0	0	0	0
20 Arab	2/6/2008	6:34 AM	Flash Flood	N/A	0	0	27K	0K
21 Albertville	2/6/2008	6:39 AM	Flash Flood	N/A	0	0	0K	0K
22 ALLEN XRDS	1/6/2009	8:16	Flood	N/A	0	0	450.00K	0.00K
23 NORTH ARAB	1/6/2009	17:00	Flash Flood	N/A	0	0	0.00K	0.00K
24 RUTH	1/6/2009	20:32	Flash Flood	N/A	0	0	0.00K	0.00K
25 GRASSY	2/27/2009	13:15	Flash Flood	N/A	0	0	0.00K	0.00K
26 MT OLIVE	5/6/2009	5:25	Flash Flood	N/A	0	0	0.00K	0.00K
27 DOUGLAS	5/6/2009	5:25	Flash Flood	N/A	0	0	10.00K	0.00K
28 OLEANDER	5/6/2009	7:15	Flood	N/A	0	0	5.00K	0.00K
29 DOUGLAS	5/6/2009	9:00	Flood	N/A	0	0	5.00K	0.00K
30 BOAZ	6/28/2009	16:03	Flash Flood	N/A	0	0	0.00K	0.00K
31 HORTON	12/18/2009	9:47	Flood	N/A	0	0	0.00K	0.00K
32 ROCKY RIDGE	1/24/2010	10:30	Flash Flood	N/A	0	0	0.00K	0.00K
33 ALBERTVILLE	8/16/2010	18:50	Flash Flood	N/A	0	0	0.00K	0.00K
34 ARAB	3/9/2011	7:00	Flash Flood	N/A	0	0	0.00K	0.00K
35 NORTH ARAB	3/9/2011	7:00	Flash Flood	N/A	0	0	0.00K	0.00K
36 ARAB	3/9/2011	7:00	Flash Flood	N/A	0	0	0.00K	0.00K
37 LITTLE NEW YORK	3/9/2011	7:00	Flash Flood	N/A	0	0	0.00K	0.00K
38 GRASSY	3/9/2011	7:00	Flash Flood	N/A	0	0	0.00K	0.00K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
39 LITTLE NEW YORK	3/9/2011	7:00	Flash Flood	N/A	0	0	0.00K	0.00K
40 HULACO	3/9/2011	11:00	Flood	N/A	0	0	0.00K	0.00K
41 ALBERTVILLE	9/5/2011	9:30	Flash Flood	N/A	0	0	15.00K	0.00K
42 GUNTERSVILLE	9/5/2011	14:15	Flash Flood	N/A	0	0	0.00K	0.00K
43 ROCKY RIDGE	11/30/2011	7:00	Flood	N/A	0	0	0.00K	0.00K
44 HEBRON	1/23/2012	5:30	Flash Flood	N/A	0	0	100.00K	0.00K
45 HORTON	1/26/2012	13:35	Flash Flood	N/A	0	0	0.00K	0.00K
46 BOAZ	1/26/2012	13:50	Flash Flood	N/A	0	0	0.00K	0.00K
47 ALBERTVILLE MUNI ARP	1/26/2012	13:50	Flash Flood	N/A	0	0	0.00K	0.00K
48 SARATOGA	1/26/2012	19:00	Flood	N/A	0	0	5.00K	0.00K
49 BOAZ	4/28/2013	15:47	Flood	N/A	0	0	0.00K	0.00K
50 ALBERTVILLE MUNI ARP	5/6/2013	5:50	Flood	N/A	0	0	0.00K	0.00K
51 ROCKY RIDGE	5/6/2013	5:50	Flood	N/A	0	0	0.00K	0.00K
52 SARATOGA	5/6/2013	5:51	Flood	N/A	0	0	0.00K	0.00K
53 HEBRON	7/7/2013	17:21	Flash Flood	N/A	0	0	0.00K	0.00K
54MOUNTAINVIEW	8/6/2013	9:10	Flash Flood	N/A	0	0	0.00K	0.00K
MARSHALL (ZONE)	4/6/2014		Flooding	N/A	0	0	0.00K	0.00K
ALBERTVILLE MUNI ARP	4/29/2014	1256	Flood	N/A	0	0	0.00K	0.00K
NORTH ARAB	12/25/2015	930	Flash Flood	N/A	0	0	0.00K	0.00K
GRANT	12/25/2015	1055	Flash Flood	N/A	0	0	0.00K	0.00K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
CLAYSVILLE	12/25/2015	1256	Flash Flood	N/A	0	0	0.00K	0.00K
ALBERTVILLE MUNI ARP	2/24/2016	620	Flood	N/A	0	0	0.00K	0.00K
GUNTERSVILLE	1/23/2017		Flood	N/A	0	0	0.00K	0.00K
BOAZ	6/30/2017	649	Flood	N/A	0	0	0.00K	0.00K
ALBERTVILLE	6/30/2017	736	Flood	N/A	0	0	0.00K	0.00K
ALBERTVILLE	6/30/2017	942	Flood	N/A	0	0	0.00K	0.00K
ALBERTVILLE	6/30/2017	958	Flood	N/A	0	0	0.00K	0.00K
ROCKY RIDGE	3/1/2018	800	Flood	N/A	0	0	0.00K	0.00K
ALBERTVILLE	9/26/2018	600	Flash Flood	N/A	0	0	0.00K	0.00K
RABBIT TOWN	2/21/2019	2040	Flood	N/A	0	0	0.00K	0.00K
MARSHALL (ZONE)	2/23/2019		Flood	N/A	0	0	0.00K	0.00K
MIDWAY	2/24/2019	600	Flood	N/A	0	0	0.00K	0.00K
MARSHALL (ZONE)	2/27/2019		Flood	N/A	0	0	0.00K	0.00K
MARSHALL (ZONE)	3/6/2019		Flood	N/A	0	0	0.00K	0.00K
Totals:					0	4	1.095M	12.00K

Source: National Climatic Data Center

Table E-8. Marshall County Hurricane Events, 1995-2019

3 hurricane and tropical storm event s were reported in Marshall County, Alabama between 01/01/1995 and 12/31/2019.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 ALZ001>050	10/04/1995	1200	Hurricane Opal/high Winds	N/A	2	0	0.1B	10.0M
2 ALZ001 - 001>003 - 005>010 - 016	07/10/2005	06:00 PM	Tropical Storm	N/A	0	0	0	0
3 ALZ001>010 - 016	08/29/2005	08:00 PM	Tropical Storm	N/A	0	0	0	0
				TOTALS:	2	0	100.000M	10.000M

Source: National Climatic Data Center

Table E-9. Marshall County Winter Storms/Freezes Events, 1993-2019

72 winter weather and extreme cold events were reported in Marshall County, Alabama between 01/01/1993 and 11/12/2019.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 ALZ001>018	3/12/1993	2200	Winter Storm	N/A	4	0	5.0B	0
2 ALZ001>011 - 014 - 016>018 - 020	2/6/1995	2100	Snow/ice	N/A	0	0	0	0
3 North Alabama	2/11/1995	1300	Snow/ice	N/A	0	0	0	0
4 ALZ001>038	1/6/1996	8:00 PM	Winter Storm	N/A	0	0	380K	38K
5 ALZ001>027 - 030>032 - 034	2/1/1996	3:00 PM	Winter Storm	N/A	0	0	595K	0
MARSHALL (ZONE)	2/3/1996	6:00 PM	Cold/Wind Chill	N/A	0	0	0	0
6 ALZ003>015	2/16/1996	2:00 AM	Winter Storm	N/A	0	0	195K	0
MARSHALL (ZONE)	3/7/1996	8:00	Cold/Wind Chill		0	0	0.00K	1.000M

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
7 ALZ001>010	1/10/1997	10:00 AM	Winter Storm	N/A	0	0	64K	0K
8 ALZ001>010 - 016 - 018>021 - 028>029 - 037>038 - 047	12/29/1997	1:00 AM	Winter Storm	N/A	0	0	0K	0K
9 ALZ006>010 - 018>021	2/4/1998	1:30 AM	Winter Storm	N/A	0	0	27K	0K
10 ALZ001>008 - 011>017	12/23/1998	2:00 AM	Ice Storm	N/A	1	0	14.4M	0K
11 ALZ001>010 - 016>018 - 020 - 026	1/6/1999	12:00 PM	Winter Storm	N/A	0	0	0K	0K
12 ALZ006 - 008 - 018>019 - 028	1/28/2000	4:00 AM	Winter Storm	N/A	0	0	75K	0K
13 ALZ006>010 - 016>018 - 024>027	3/20/2001	12:00 AM	Heavy Snow	N/A	0	0	0K	0K
14 ALZ008 - 010	2/26/2004	2:05 AM	Winter Storm	N/A	0	0	0	0
15 ALZ008 - 009	12/1/2008	2:30 AM	Winter Weather	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/16/2009	3:20	Cold/Wind Chill		0	0	0.00K	0.00K
16 MARSHALL (ZONE)	2/12/2010	7:30	Heavy Snow	N/A	0	0	0K	0K
17 MARSHALL (ZONE)	3/2/2010	0:00	Heavy Snow	N/A	0	0	0K	0K
18 MARSHALL (ZONE)	12/25/2010	7:30	Heavy Snow	N/A	0	0	0K	0K
19 MARSHALL (ZONE)	1/9/2011	17:30	Heavy Snow	N/A	0	0	0K	0K
20 MARSHALL (ZONE)	2/3/2011	14:00	Heavy Snow	N/A	0	0	0K	0K
21 MARSHALL (ZONE)	1/17/2013	13:00	Heavy Snow	N/A	0	0	0K	0K
22 MARSHALL (ZONE)	1/17/2013	13:00	Heavy Snow	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
MARSHALL (ZONE)	1/6/2014	2100	Cold/Wind Chill	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/17/2014		Winter Weather	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/28/2014	1200	Winter Weather	N/A	0	0	0K	0K
MARSHALL (ZONE)	2/11/2014	100	Heavy Snow	N/A	0	0	0K	0K
MARSHALL (ZONE)	2/12/2014	1600	Heavy Snow	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/24/2014	200	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	11/2/2014	0	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	11/2/2014	0	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/7/2015	2000	Extreme Cold/Wind Chill	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/15/2015	730	Winter Weather	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/16/2015	200	Freezing Fog	N/A	0	0	0K	0K
MARSHALL (ZONE)	2/19/2015	300	Cold/Wind Chill	N/A	0	0	0K	0K
MARSHALL (ZONE)	2/20/2015	1855	Ice Storm	N/A	0	0	0K	0K
MARSHALL (ZONE)	2/20/2015	1240	Winter Weather	N/A	0	0	0K	0K
MARSHALL (ZONE)	2/23/2015	0	Winter Weather	N/A	0	0	0K	0K
MARSHALL (ZONE)	2/25/2015	1300	Winter Storm	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/5/2015	200	Winter Storm	N/A	0	0	0K	0K
MARSHALL (ZONE)	11/15/2015	100	Frost/Freeze	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
MARSHALL (ZONE)	1/22/2016	1435	Winter Weather	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/22/2016	1435	Winter Weather	N/A	0	0	0K	0K
MARSHALL (ZONE)	2/9/2016	715	Winter Weather	N/A	0	0	0K	0K
MARSHALL (ZONE)	11/20/2016	200	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	10/30/2017	0	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	12/8/2017	700	Winter Weather	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/1/2018	400	Cold/Wind Chill	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/2/2018	0	Cold/Wind Chill	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/15/2018		Winter Weather	N/A	0	0	0K	0K
DOUGLAS	1/16/2018	2300	Cold/Wind Chill	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/16/2018	1200	Winter Weather	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/20/2018		Cold	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/8/2018	100	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/8/2018	2100	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/13/2018	200	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/13/2018	2100	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/14/2018	0	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/22/2018	700	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	4/8/2018	0	Frost/Freeze	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
MARSHALL (ZONE)	11/10/2018	2100	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	12/11/2018	300	Freezing Fog	N/A	0	0	0K	0K
MARSHALL (ZONE)	1/29/2019	200	Winter Weather	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/3/2019	500	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/4/2019	1800	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/5/2019	1900	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/6/2019	2000	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	3/20/2019	200	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	4/1/2019	400	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	11/1/2019	100	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	11/2/2019	200	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	11/8/2019	2200	Frost/Freeze	N/A	0	0	0K	0K
MARSHALL (ZONE)	11/12/2019	300	Winter Weather	N/A	0	0	0K	0K
				TOTALS:	5	0	5.016B	1.38M

Source: National Climatic Data Center

Table E-10. Marshall County Drought Events, 2007-2013

21 drought event s were reported in Marshall County, Alabama between 01/01/2007 and 12/31/2013.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 ALZ001>004 - 008 - 010 - 016	3/27/2007	12:00 AM	Drought	N/A	0	0	0K	0K
2 ALZ001>010 - 016	4/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
3 ALZ001>010 - 016	5/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
4 ALZ001>010 - 016	6/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
5 ALZ001>010 - 016	7/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
6 ALZ001>010 - 016	8/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
7 ALZ001>010 - 016	9/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
8 ALZ001>010 - 016	10/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
9 ALZ001>010 - 016	11/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
10 ALZ001>010 - 016	12/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
11 ALZ001>010 - 016	1/1/2008	12:00 AM	Drought	N/A	0	0	0K	0K
12 ALZ001>010 - 016	2/1/2008	12:00 AM	Drought	N/A	0	0	0K	0K
13 ALZ001>010 - 016	3/1/2008	12:00 AM	Drought	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
14 ALZ001>010 - 016	4/1/2008	12:00 AM	Drought	N/A	0	0	0K	0K
15 ALZ001 - 004>010 - 016	5/1/2008	12:00 AM	Drought	N/A	0	0	0K	0K
16 ALZ004 - 006>010 - 016	6/1/2008	12:00 AM	Drought	N/A	0	0	0K	0K
17 ALZ004>010 - 016	7/1/2008	12:00 AM	Drought	N/A	0	0	0K	0K
18 MARSHALL (ZONE)	10/19/2010	0:00	Drought		0	0	0.00K	0.00K
19 MARSHALL (ZONE)	11/1/2010	0:00	Drought		0	0	0.00K	0.00K
20 MARSHALL (ZONE)	12/1/2010	0:00	Drought		0	0	0.00K	0.00K
21 MARSHALL (ZONE)	3/1/2011	0:00	Drought		0	0	0.00K	0.00K
MARSHALL (ZONE)	5/31/2016	0	Drought			0	0	0
MARSHALL (ZONE)	6/1/2016	0	Drought			0	0	0
MARSHALL (ZONE)	7/1/2016	0	Drought			0	0	0
MARSHALL (ZONE)	8/1/2016	0	Drought			0	0	0
MARSHALL (ZONE)	9/6/2016	0	Drought			0	0	0
MARSHALL (ZONE)	10/11/2016	0	Drought			0	0	0
MARSHALL (ZONE)	11/1/2016	0	Drought			0	0	0
MARSHALL (ZONE)	10/1/2019	0	Drought			0	0	0
				TOTALS:	0	0	0	0

Source: National Climatic Data Center

Table E-11. Marshall County Extreme Heat Events, 1996-2019

12 extreme heat events were reported in Marshall County, Alabama between 01/01/1996 and 08/13/2019

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 ALZ001>050	2/23/1996	8:00 AM	Excessive Heat	N/A	0	0	0	0
2 ALZ008	6/24/2000	5:00 PM	Excessive Heat	N/A	1	0	0K	0K
3 ALZ001>010 - 016	8/1/2007	12:00 AM	Heat	N/A	0	0	0K	0K
4 MARSHALL (ZONE)	7/7/2010	22:00	Heat	N/A	0	0	0.00K	0.00K
5 MARSHALL (ZONE)	7/23/2010	10:00	Heat	N/A	0	0	0.00K	0.00K
6 MARSHALL (ZONE)	8/1/2010	0:00	Heat	N/A	0	0	0.00K	0.00K
7 MARSHALL (ZONE)	6/29/2012	12:00	Heat	N/A	0	0	0.00K	0.00K
8 MARSHALL (ZONE)	6/30/2012	12:00	Heat	N/A	0	0	0.00K	0.00K
9 MARSHALL (ZONE)	7/1/2012	12:00	Heat	N/A	0	0	0.00K	0.00K
MARSHALL (ZONE)	6/15/2015		Heat Wave	N/A	0	0	0.00K	0.00K
MARSHALL (ZONE)	7/22/2015		Heat Wave	N/A	0	0	0.00K	0.00K
MARSHALL (ZONE)	8/13/2019	900	Heat	N/A	0	0	0.00K	0.00K
				TOTALS:	1	0	0	0

Source: National Climatic Data Center

Table E-12. Marshall County Other Natural Hazard Events, 2015 -2019

Other Events Recorded by the National Climatic Data Center 08/06/2015 – 10/29/2019

Location	Date	Event
Albertville	8/6/2015	Microburst
ALBERTVILLE	10/10/2016	Wildfire
GRANT MTN.	10/18/2016	Fire
UNION GROVE	10/29/2016	Fire

Appendix F
Alternative Mitigation Measures

App. F – Alternative Mitigation Measures

1.0 Identification and Analysis of Mitigation Measures
2.0 Types of Mitigation Measures

1.0 Identification and Analysis of Mitigation Measures

During the planning process, the Hazard Mitigation Planning Committee (HMPC) reviewed mitigation measures from previous plans and also measures that they developed during the mitigation planning meetings. The HMPC members conducted an implementation status review on the mitigation strategies of the 2014 plan. They looked at the community action program for their jurisdiction, and determined if the measures had been completed, were on-going, or if they were items that should be deleted. After they reviewed the 2014 measures, they developed new measures based off of discussions during the mitigation plan meetings held for this update. The new measures were combined with the previous plan's and the mitigation strategies list was created. This list was provided to the jurisdictions for their use in determining which mitigation measures they wanted to pursue over the next five years. This appendix contains the mitigation list that was presented to the HMPC members for their selection of final action programs for each participating community. Also included is an updated table of alternative measures that summarizes the measure as an action or project, whether new or existing buildings and infrastructure are affected, and the hazard that would be addressed by the measures. Some measures affect people and not structures so the cell under what structure (new or existing) is affected is left blank.

2.0 Types of Mitigation Measures

Prevention Measures. Prevention measures involve adopting and administering ordinances, regulations, programs, and plans that can influence the development of land and buildings to minimize risks of loss due to natural and man-made hazards.

- *Comprehensive Plans and Smart Growth.* Comprehensive plans guide future development over a long-range framework through land use, community facilities, economic development, environmental conservation, public infrastructure, and related planning. Effective comprehensive planning can help create safer and more sustainable communities with improved disaster resistance. By incorporating "Smart Growth" principles in a community's comprehensive plan, a community can improve the effectiveness and responsiveness of its comprehensive plan to hazards identified in the mitigation planning process. Smart Growth can result in safe growth through these fundamental principles of sustainable community development: (a) promote compact infill development vs. urban sprawl, (b) preserve open space and protect the natural and beneficial functions of flood plains, coastal zones, wetlands, hillsides, and other vulnerable locations; and (c) steer growth away from hazardous areas. A comprehensive plan can designate vulnerable lands for open space uses that would not be

incompatible with occasional hazard events. For instance, vulnerable areas subject to flooding, dam failure inundation, landslide risk, and land subsidence could be planned for parks, greenways, wildlife refuges, and other open space uses. For a comprehensive plan to be truly effective, the hazard vulnerability of lands and buildings assessed through the mitigation planning process should influence a community's comprehensive plan for future land use and development patterns, community facilities, and infrastructure. The comprehensive plan should direct growth toward the most suitable land areas and avoid exposure of new buildings and infrastructure to high risk hazard locations assessed in the mitigation plan. Equally important to the effectiveness of a comprehensive plan, is the integration of planning strategies. A community's mitigation strategy should be carried over into the goals, objectives, and policies of its comprehensive plan.

- *Capital Improvements Plans (CIP).* A CIP can recommend the setting aside of funds for public improvements, including water and sewer service extensions, new community facilities, land acquisitions for open space, emergency service facilities, improvements to retrofit or relocate vulnerable critical facilities, and other capital improvements that can be tied to both the comprehensive plan and the mitigation plan. The CIP schedules capital projects over a 5-6-year time frame, with funding identified. The capital expenditure requirements of high priority projects within a hazard mitigation plan may be included in a CIP. A CIP for public infrastructure improvements, when combined with zoning and land development controls, can establish a growth management program to direct the location and timing of new development in accordance with a comprehensive plan and smart growth principles to avoid hazard areas.
- *Planning Studies.* Planning for areas of special consideration might be considered in certain situations. These planning studies might evaluate the feasibility of various mitigation alternatives to address a specific hazard concern, such as a detailed flood hazard mitigation plan for a stream that updates hydrology, generates new flood profiles, and evaluates economic feasibility of structural and non-structural alternatives using sophisticated economic models. Another example would be geologic investigations to identify areas subject to landslides and recommendations for corrective measures.
- *Zoning and Land Development Controls.* The zoning ordinance is the primary tool to regulate development in vulnerable areas by limiting development. Zoning can be combined with a variety of related land development controls and special purpose ordinances. Growth management controls of density and infrastructure improvements may reduce risks in areas exposed to severe hazards, such as flooding, landslides, sinkholes, and other location specific hazards. Limited density controls could be applied to certain zones to discourage future development, or vulnerable areas could be zoned for recreation or agricultural uses or other uses that are compatible with the natural restrictions of the location. Landscaping standards can be incorporated into zoning ordinances to set aside minimum areas for tree and vegetation plantings. Planting areas can be used for drainage and help cool urban environments, as well as improve appearances. Tolerant species can be used to mitigate the effects of drought conditions, often referred to as "xeriscapes." Other special purpose ordinances might address

hillside development by placing limits or setting minimum standards for building construction in steeply-sloped areas that are prone to landslides. Transfer of development rights (TDR) programs are another tool for growth management by allowing landowners to transfer the right to develop one parcel of land to a different parcel of land. This could benefit the developer if incentives are given for building in suitable land areas and not building in hazardous areas.

- *Subdivision Regulations.* These regulations govern how land can be divided into separate lots or sites. Subdivision plats can be required to show hazard areas, such as flood zones, areas subject to landslides, and potential sinkhole locations. The regulations should establish minimum buildable lot areas that are sufficient to meet property protection objectives. Requiring new subdivisions to space buildings, install fire hydrants, and provide adequate access are some of the measures available to reduce the risks of fires.
- *Building and Technical Codes.* Standards can be incorporated into building and technical codes that address resistance against natural hazard threats for all new and substantially improved or repaired buildings. The International Code Series are the latest available codes. Building codes can prohibit loose masonry, overhangs, etc. that might be affected by earthquakes. Building code standards for roof materials and spark arrestors can mitigate fires. Standards can be set for roof construction to protect against wind damage from hurricanes, tornadoes, and severe storms. Performance standards for foundation supports, utility protection, also add to building protection. Design standards can mandate that quality building products and construction applications are used. These codes can better assure quality constructed structures, which are more likely to withstand high winds, severe storms, and other natural hazards. A site plan review process as part of local building permitting can ensure that site elements are organized and planned to lessen the effects of potential hazards on new development.
- *Flood Plain Management Programs.* Participation in the NFIP (National Floodplain Insurance Program) is based on a community agreement with FEMA to meet minimum program requirements, including the adoption and continuing enforcement of a flood plain management ordinance. Flood Insurance Rate Maps (FIRM) are not only a tool for managing flood plain development, but the maps also create broad-based awareness of flood hazards. Flood Insurance Studies and accompanying FIRMs provide the data needed to administer floodplain management programs and to establish flood insurance rates for new and existing buildings. Often, Flood Insurance Rate Maps need updates to reflect changing developing in a given watershed. This may require comprehensive and detailed hydrologic and hydraulic modeling and improved topographic mapping to modernize existing maps. Updated FIRMs may also be needed in “Approximate” flood zones where no flood elevations or profiles are available. DFIRMS or Digital FIRMS can be created for computer and on-line access to maps and data. The Community Rating System (CRS) Program of the (NFIP) is an option that covers all flood hazard mitigation program elements. The CRS rewards communities for conducting a full range of flood mitigation programs that exceed the minimum NFIP requirements by awarding points to achieve a rating classification. Total points determine the class of a

community. The higher the class, the more savings to flood insurance holders and more recognition to the successes of the local flood plain management program. With or without CRS participation, a community can establish "Higher Regulatory Standards" for flood plain management. Floodplain management regulations do not prohibit development in the special flood hazard area; instead, the regulations impose construction standards to minimize damages. Communities may adopt more stringent standards than those set forth by the NFIP, such as additional building elevation requirements, additional limitations on building enclosures, and other standards designed to better mitigate flood damages. Another method to improve the effectiveness of flood plain management programs is to appoint a Certified Floodplain Manager (CFM) who has passed minimum criteria of the Association of State Floodplain Managers to administer the community's ordinance and program.

- *Storm Water Management Regulations*. Development outside of a floodplain can contribute significantly to flooding by creating impervious surfaces or altering natural drainage management systems, which increase storm water runoff. Storm water management is usually addressed in subdivision regulations or other land development controls. Developers are typically required to build retention or detention basins to minimize any increase in runoff rates caused by new or expanded impervious surfaces, or new drainage systems. Generally, there is a prohibition against storm water leaving the site at a rate higher than it did before the development based on a given design storm. One technique is to use wet basins as part of the landscaping plan of a development. It might even be possible to site these basins based on a watershed analysis. Since detention only controls the runoff rates and not volumes, other measures may be applied for storm water infiltration, such as, swales, infiltration trenches, vegetative filter strips, and permeable paving blocks for parking areas. Erosion and sedimentation control regulations not only assure improved water quality but help preserve the carrying capacity of drainage ways and reduce localized flooding. These regulations are typically a component of a larger storm water management program or included in a storm water management ordinance.
- *Open Space Requirements.* Preserving open space is the most effective method for preventing damages. Open space preservation for flood control should not, however, be limited to the flood plain, since other areas within the watershed may contribute to runoff that exacerbates flooding. Comprehensive plans can identify areas to be preserved by acquisition. Other means, such as purchasing easements or accepting donations of land are also available. Open space can also be protected through maintenance agreements with the landowners, or by requiring developers to dedicate land for parks, public facilities, and drainage.
- *Critical Facilities Assessments.* Assessments of critical facilities (hospitals, schools, fire and police stations, emergency operation centers, special needs housing, and others) can address building and site vulnerabilities to hazards and identify damage control measures in the event of severe weather and other natural hazards. This type of assessment can result in a plan to identify a variety of mitigation retrofit measures to reduce vulnerability to damage and disruption of operations during severe weather and disaster events.

- *Geographic Information Systems (GIS).* GIS applies computer technology to hazard mitigation planning by linking data to maps. Detailed property information, socioeconomic data, critical facilities inventories, and hazard locations, among other relevant information, can be continuously updated to provide a complete assessment resource for mitigation planning and other planning studies. HAZUS-MH is a risk assessment tool developed by FEMA to apply loss estimation models for earthquakes, hurricane winds, and flooding within a GIS framework.
- *Dam Safety Management.* A comprehensive dam safety program should begin with dam failure inundation maps. These areas should be kept clear of new development and preserved as open space to prevent future damages. Flood plain regulations could establish minimum building elevations based on predicted flood elevation in the event of dam failure. Regular dam safety inspections identify risks of failures.
- *Open Burning Regulations.* Open burning restrictions can be enforced to prevent the spread of wildfires, especially during times of drought when emergency measures could be enacted.
- *Public Right-of-Way Maintenance Regulations.* An effective drainage system maintenance program should also include regulations that prevent dumping and littering in ditches and stream channels and require adjoining property owners to keep these areas clear of fallen trees, limbs, dead brush, and any other debris. These efforts not only prevent obstructions to drainage but can also help mitigate wildfires.
- *Technology Programs.* Modern technology has created new opportunities for improving planning systems to support hazard mitigation. These systems can serve dual functions - to monitor hazard events as they happen for disaster warning purposes and to forecast and simulate events for advance planning purposes. The U.S. Geologic Survey (USGS) ALERT gage networks for select rivers and streams allow the National Weather Service (NWS) to handle early recognition of flooding. Local gages to cover high risk flood areas can be integrated into these systems with local EMA access. New technology has become available to monitor tornado activities. A comprehensive system can tie a variety of gages into a single automated network to monitor rainfall, river/stream stages, icy bridges and highways, tornadoes, winds, water quality, chemical spills into water ways, and hazardous air emissions. Remote cameras can enhance the monitoring capabilities of the system. These systems when used to simulate events can test a variety of mitigation alternatives, such as flood simulations, evaluation of structural alternatives on flood levels, and damage estimates from simulated events.
- *Safe Room/Shelter Requirements.* Some communities have enacted safe room or shelter requirements for new housing construction and require community shelters for manufactured home parks, apartment complexes, and other planned residential communities.

Human Welfare and Property Protection Measures. Property protection measures protect structures and their occupants and contents from the damaging effects of natural hazard occurrences, including retrofitting existing structures to increase their resistance to damage and exposure of occupants to harm; relocating vulnerable structures and occupants from hazard locations; and conversion of developed land to permanent open space through acquisition and demolition of existing structures.

- *Building Relocations.* Moving structures out of vulnerable areas, such as high-risk flood plains, dam inundation areas, landslide zones, and land subsidence areas, is a sure way to protect against damage. Relocation is expensive, however, so this approach should not be used except in extreme circumstances, where there are no practical alternatives.
- *Acquisition Projects.* Acquisition of land in a highly vulnerable zone protects against damages and casualties and converts problem areas into community assets, with accompanying environmental benefits. Acquisition, followed by demolition and conversion of land to permanent open space, is the most appropriate strategy for those buildings that have experienced recurring flood damages and flood insurance claims. This method might also be considered for older buildings with finish floor elevations several feet below predicted flood elevation. Often buildings are too expensive to move or are dilapidated and not worth saving or protecting. Acquisition, like relocation, can be very expensive. Benefit-cost analysis must be used to be certain the damages avoided outweigh the acquisition costs. Less costly alternatives might also be investigated.
- *Building Elevations.* Elevating a flood-prone building above the base flood elevation is sometimes the best flood mitigation strategy. The building could be raised above the flood elevation to prevent interior water damage. This approach could be less costly than relocation or acquisition, and if properly designed the elevated buildings could be less disruptive than creating vacant lots as a result of relocations or acquisitions. Elevation is required by local flood plain regulations for new and substantially improved buildings in a floodplain and is a commonly-practiced flood hazard prevention method.
- *Building Retrofits.* Existing buildings can be retrofitted to safeguard against possible damages. In addition to flood proofing or elevating existing buildings in a flood plain, other retrofits could protect buildings against natural hazards. Retrofitting to add braces/ roof straps and remove overhangs protects against high winds. Storm shutters and applying Mylar to windows and glass surfaces protects from shattering glass during hazard events. Tie downs of major appliances and other contents may reduce earthquake damage.
- *Flood Proofing.* If a building cannot be elevated, it may be flood proofed. This approach works well in areas of low flood threat and with nonresidential buildings. Flood proofing can be accomplished through barriers to flooding, or by treatment to the structure itself.
    - ✓ *Dry flood proofing* seals a building against the water by coating the walls with waterproofing compounds or plastic sheeting. Openings, such as doors, windows, etc. are closed. Sometimes, manual intervention may be required to implement dry flood proofing, such as installing removable flood shields at doorways.
    - ✓ *Wet flood proofing* is usually considered a last resort measure since water is intentionally allowed into the building in order to minimize pressure on the structure. This is best applied to unfinished areas, such as warehouses and garages where contents are elevated.
    - ✓ *Barriers*, such as small levees, floodwalls, and berms can keep floodwaters from reaching a building. These are most useful in areas subject to shallow flooding.

  - ✓ *Other flood proofing approaches* range from moving valuable items to higher floors to rebuilding the floodable area. An advantage over other approaches is that simply by moving household goods out of the range of floodwaters, thousands of dollars can be saved in damages.
- *Critical Facilities Protection*. Protecting critical facilities is vital. Efforts should be made to retrofit or relocate existing facilities located in high-risk zones or construct new facilities for maximum protection from hazards. Protection of facilities includes not only buildings but also utilities, bridges, and other critical infrastructure.
- *Emergency Power Generation.* Maintaining power in the event of loss during severe storms and other natural hazards is vital for the continuing operation of critical facilities, especially, emergency services, hospitals, elderly housing, water distribution, sewer treatment, and other facilities. Power shutdowns could cause major disruptions and consequential damages. Relatively low-cost portable generations can supply temporary power to small critical facilities, households, and small businesses.
- *Human Welfare*. Protecting the public from pandemics and infectious diseases through collaboration between surrounding communities and state and federal agencies if necessary, to control and address the spread of the disease. It is vital that the communities communicate the levels of preparedness and needs to those in the healthcare community to ensure everything is in place to address the impact of the event.

Education and Awareness. Education and awareness methods educate and inform staff and the public about the risks of hazards and the techniques available to reduce threats to life and property.

- *Community Hazard Mitigation Plan Distribution.* Internet downloads and CDs are some of the means for mass distribution of the mitigation plan to the public. A fold-out, poster-size summary document could be printed for mass mailings or a special summary document could be published in the Sunday edition of the local newspaper.
- *Flood Map Information.* Flood Insurance Rate Maps (FIRM) developed by FEMA outline the boundaries of the flood hazard areas and provide other valuable information on flooding conditions. These maps can be used by anyone interested in a particular property to determine if it is flood-prone. NFIP communities can provide this information to the real estate agents, builders, developers, and homeowners as a public service.
- *Outreach Projects*. Outreach projects are proactive; they give the public information even if they have not asked for it. Outreach projects are designed to encourage people to seek out more information and take steps to protect themselves and their properties. Outreach programs work, although awareness is not enough. People need to know what they can do about the hazards, so projects should include information on protection measures. Locally designed and run programs are often more effective than national advertising. The following are just a few of the examples of outreach activities:
  - ✓ City or county government newsletters with articles on hazard mitigation.
  - ✓ Notices directed to floodplain residents encouraging the purchase of flood insurance.

- ✓ Displays in public buildings, malls, festivals, fairs, and other public assembly places, including colorful GIS maps, brochures, and information handouts.
- ✓ Newspaper articles and special sections addressing hazards.
- ✓ Radio and TV news releases and interviews shows.
- ✓ A flood proofing video for cable TV programs and for loan to organizations.
- ✓ A detailed property owner handbook tailored for local conditions.
- ✓ Presentations at meetings of neighborhood groups.

- *Hazard Insurance Awareness.* Above and beyond standard property insurance, coverage may be available to property owners for protection against flood damages, if the property is in a community that participates in the National Flood Insurance Program. Any local insurance agent is able to sell flood insurance policies under rules and rates set by FEMA. Flood insurance may also be advisable for properties located in dam inundation areas. Flood insurance is also available for areas outside of mapped flood zones. Flood damage may still occur outside of a flood plain as a result of poor drainage or other causes. Property owners may also purchase additional insurance riders for specific hazard coverages, such as insurance riders for earthquake, landslides, or sinkhole damage.
- *Real Estate Disclosure.* Disclosure of information regarding flood-prone properties is important if potential buyers are to be in a position to mitigate damage. Federally regulated lending institutions are required to advise applicants that a property is in the floodplain. However, this requirement needs to be met only days prior to closing, and by that time, the applicant is typically committed to the purchase. State laws and local real estate practice can help by making this information available to prospective buyers early in the process.
- *Library*. Your local library can serve as a repository for pertinent information on hazards and methods of protection. Some libraries also maintain their own public information campaigns, augmenting the activities of the various governmental agencies involved in hazard mitigation.
- *Technical Assistance.* Certain types of technical assistance are available from the local technical and professional staff to advise on various mitigation alternatives to property owners. Community officials can also set up a service delivery program to provide one-on-one sessions with property owners. An example of technical assistance is the hazard audit, in which a specialist visits a property. The specialist advises the owner of alternative protection measures.
- *Education Programs*. Education can be a great mitigation tool. The earlier education begins the better. Education programs for children can be taught in the schools, park and recreation departments, conservation associations, or youth organizations. An activity can be as involved as course curriculum development or as simple as an explanatory sign near a river. Education programs do not have to be limited to children. Adults can benefit from knowledge of hazards and mitigation measures, and local officials, loaded with this knowledge, can make more informed decisions on mitigation actions.
- *Mass Media Relations.* Newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, and on-line social networking are some of the ever-changing mass media tools available for increasing public awareness and distributing public information on hazard

mitigation topics. Effective media relations are essential to a comprehensive outreach program.

- *NOAA Weather Radio Programs.* The use of inexpensive weather radios in homes and businesses are another means for advance warning and can be promoted as a public service. Some localities may choose to purchase these radios in bulk and distribute them to residents at little or no cost. A corporate sponsor can bear some or all of the costs.
- *Training and Webinars.* Staying up on the latest findings in regard to the hazards that impact the communities is important along with new mitigation techniques and funding. With so much training and information available through the internet, the jurisdictions can find many resources to help them with issues that arise due to the hazards. Departments and agencies such as the Department of Homeland Security and FEMA have courses on cybersecurity, addressing human-caused hazards and funding sources for mitigation actions and projects; many that are of no cost. Jurisdictions should take advantage of such training.
- *Disaster Warning and Notification.* The most important measure for all hazards is warning systems. Getting the message out to the people in the area that a hazard event is about to or is occurring is vital in saving lives. There are many avenues for warning citizens and the jurisdictions should employ as many as feasible. Those avenues include but are not limited to cell phone alerts, televised notices, warning sirens, weather radio announcements, AM/FM radio alerts, permanent signs at danger areas, and digital informational signage above highways.

Natural Resources Protection Measures. Natural resources protection measures preserve and restore the beneficial functions of the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.

- *Wetlands Protection.* Wetlands are capable of storing large amounts of floodwaters, slowing and reducing downstream flows, and filtering the water. Any development that is proposed in a wetland is regulated by either federal and/or state agencies. Depending on the location, the project might fall under the jurisdiction of the U.S. Army Corps of Engineers, which in turn, calls upon several other agencies to review the proposal. Communities may also have local wetland ordinances. Generally, the goal is to protect wetlands by preventing development that would adversely affect them. Mitigation techniques are often employed, which might consist of creating a wetland on another site to replace what would be lost through the development.
- *Open Space Easements and Acquisitions.* Acquiring easements and fee-simple ownership of environmentally beneficial lands, such as hillsides, flood plains, and wetlands, assures permanent protection. Acquisitions can be made by a land trust or a public agency to benefit the public welfare. Often, property owners may be willing to dedicate lands and easements for tax advantages.

- *River/Stream Corridor Restoration and Protection.* Restoration and protection of stream or riverbanks and riparian zones help restore the natural and beneficial functions to manage floods and filter runoff. Streams should also be protected from dumping. Often, greenways or linear parks along these corridors provide amenities that are compatible with natural functions.
- *Urban Forestry Programs.* A number of cities nationwide have participated in formal urban forestry programs. Urban forestry programs which follow Tree City USA guidelines for public lands and rights-of-way help maintain healthy tree cover for multiple mitigation purposes. Protection and maintenance of the urban forest is especially helpful for the mitigation of wildfires, hillside erosion and landslides, and restoration of stream and river corridors. Combined with effective landscaping regulations, both private and public spaces can be addressed.
- *Water Resources Conservation Programs.* Protection of water quantity and quality through water conservation programs can help mitigate the effects of droughts.

Structural Projects Measures. Structural projects measures are engineering structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of a hazard on a community.

- *Reservoirs*. Reservoirs control flooding by holding water behind dams or in storage basins. After a flood peaks, water is released or pumped out slowly at a rate the river downstream can handle. Reservoirs are suitable for protecting existing development, and they may be the only flood control measure that can protect development close to a watercourse. They are most efficient in deeper valleys or on smaller rivers where there is less water to store. Reservoirs might consist of man-made holes dug to hold the approximate amount of floodwaters, or even abandoned quarries. As with other structural projects, reservoirs projects have drawbacks, as follows:
    - expensive
    - occupy a lot of land
    - require periodic maintenance
    - may fail to prevent damage from floods that exceed design levels
    - may eliminate the natural and beneficial functions of the floodplain.

  Reservoirs should only be used after a thorough watershed analysis that identifies the most appropriate location and ensures that they would not cause flooding somewhere else. Because they are so expensive and usually involve more than one community, they are typically implemented with the help of state or federal agencies, such as the Army Corps of Engineers.
- *Levees/Floodwalls.* A commonly known structural flood control measure is either a levee (a barrier of earth) or a floodwall made of steel or concrete erected between the watercourse and the land.

- *Drainage Modifications.* These include man-made ditches and storm sewers that help drain areas where the surface drainage system is inadequate or where underground drainage ways may be safer or more attractive. These approaches are usually designed to carry the runoff from smaller, more frequent storms.
- *Storm Sewers.* Mitigation techniques for storm sewers include installing new sewers, enlarging small pipes, street improvements, and preventing back flow. Because drainage ditches and storm sewers convey water faster to other locations, improvements are only recommended for small local problems where the receiving body of water can absorb the increased flows without increased flooding. In many developments, streets are used as part of the drainage system, to carry or hold water from larger, less frequent storms. The streets collect runoff and convey it to a receiving sewer, ditch, or stream. Allowing water to stand in the streets and then draining it slowly can be a more effective and less expensive measure than enlarging sewers and ditches.
- *Drainage System Maintenance.* Ongoing maintenance of streams and drainage channels is necessary if these facilities are to function effectively and efficiently over time. Maintenance of channel growth within or near stream and river channels is important for bank stabilization and to prevent obstructions of drainage flows. Often sediment buildup can impede stream flow. Regular maintenance is necessary for public drainage systems, including constructed components, such as, ditches, culverts, and bridges and natural components, such as swales, intermittent and perennial streams, and stream and river overbank areas. Maintenance assures adequate conveyance of storm and flood waters. Other maintenance programs to clear dead and dry brush and fallen trees can not only prevent obstructions to drainage but also mitigate wildfires.
- *Dam Modifications.* Unsafe dams can be removed or modified to lessen the risks of dam failure, such as spillway enlargements to lessen hydraulic loads.
- *Ground Stabilization.* Unstable areas susceptible landslides or sinkholes may be stabilized to lessen risk of failure.
- *Community Storm Shelter/Safe Room Construction.* Freestanding, single-purpose community storm shelters or safe rooms within a building used for other purposes can be constructed to provide temporary shelter from hurricanes, tornadoes, and severe storms.

Table F-1. Alternative Types of Mitigation Measures

TYPES OF MITIGATION MEASURES	Action or Project	Affects New or Existing Buildings and Infrastructure	Tornadoes	Flooding	Severe Storms	Winter Storms	Hurricanes	Drought	Extreme Heat	Earthquakes	Wildfires	Dam or Levee Failures	Landslides	Sinkholes	Human-Caused	Technological	Pandemic/Infectious Disease
PREVENTION MEASURES																	
Comprehensive Plans and Smart Growth	Action	Both		X			X				X	X	X	X			
Planning Studies	Action	Both	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Zoning and Subdivision Regulations	Action	Both		X			X				X	X	X	X	X		
Building and Technical Codes	Action	Both	X	X	X	X	X	X	X	X	X	X	X	X	X		
Floodplain Management Regulations and Programs	Action	Both		X								X					
Community Rating System Program	Action	Both		X													
Storm Water Management Regulations	Action	Both		X	X												
Open Space Preservation	Action	Both		X			X				X		X	X			
Landscape Ordinances	Action	Both		X	X		X	X			X		X		X		
Critical Facilities Assessments	Action	Both	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Geographic Information Systems	Action	Both	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Dam Safety Management	Action	Both		X								X					
Prescribed Burn Regulations & Wildfire Management	Action	Both									X						
Emergency Operations Plans	Action		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

TYPES OF MITIGATION MEASURES	Action or Project	Affects Existing or New Buildings and Infrastructure	Tornadoes	Flooding	Severe Storms	Winter Storms	Hurricanes	Droughts	Extreme Heat	Earthquakes	Wildfires	Dam or Levee Failures	Landslides	Sinkholes	Human-Caused	Technological	Pandemic / Infectious Disease
HUMAN WELFARE AND PROPERTY PROTECTION MEASURES																	
Building Relocation	Project	Existing		X			X						X	X			
Building Acquisition	Project	Existing		X			X						X	X			
Building Elevation	Project	Existing		X													
Building Retrofits	Project	Existing	X	X	X	X	X	X		X	X				X		
Flood Proofing	Project	Existing		X													
Critical Facilities Protection	Project	Existing	X	X	X	X	X	X		X	X				X		
Emergency Power Generation	Project	Both	X		X	X	X			X					X	X	
Community Shelters and Safe Rooms	Action	Both	X		X		X				X						
Human Health and Welfare Programs	Action	N/A	X						X								
EDUCATION, OUTREACH, AND AWARENESS MEASURES																	
Community Hazard Mitigation Plan Distribution	Action	Both	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Technical Assistance	Action	Both	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Flood Map Information	Action	Both		X			X										
Hazard Insurance Awareness	Action	Both	X	X			X			X	X		X	X	X		
Publication Distribution	Action	Both	X	X	X	X	X	X		X	X	X	X	X	X	X	X
Outreach Projects	Action	Both	X	X	X	X	X	X		X	X	X	X	X	X	X	X
Outreach Programs	Action	Both	X	X	X	X	X	X		X	X	X	X	X	X	X	X
Training and Webinars	Action		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Disaster Warning and Notification	Action		X	X	X	X	X		X	X	X	X			X	X	X
Weather Radio Programs	Action	Existing	X	X	X	X	X	X		X							

TYPES OF MITIGATION MEASURES	Action or Project	Affects Existing or New Buildings and Infrastructure	Tornadoes	Flooding	Severe Storms	Winter Storms	Hurricanes	Droughts	Extreme Heat	Earthquakes	Wildfires	Dam or Levee Failures	Landslides	Sinkholes	Human-Caused	Technological	Pandemic / Infectious Disease
Mass Media Relations and Websites	Action	Both	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NATURAL RESOURCES PROTECTION MEASURES																	
Open Space Easements and Acquisitions	Both	Both		X			X	X			X		X	X			
River/Stream Corridor Restoration and Protection	Both	Both		X													
Forestry Programs	Both	Both									X						
Water Resources Conservation Programs	Action							X									
NATURAL SYSTEM AND INFRASTRUCTURE IMPROVEMENTS AND MAINTENANCE																	
Drainage System and Rights-of-Way Maintenance	Project	Both	X	X	X	X	X				X						
Reservoirs and Drainage System Improvements	Project	Both		X													

Appendix G
Committee Meeting Documentation

App. G - Committee Meeting Documentation

1.0 Establishment of the Hazard Mitigation Planning Committee
2.0 Committee Meetings
3.0 Example Exercises/Worksheets
4.0 Meeting Agendas and Sign-in Sheets

1.0 Establishment of the Hazard Mitigation Planning Committee

The Hazard Mitigation Planning Committee (HMPC) was convened in 2003 to write the first mitigation plan to comply with requirements of the Federal Disaster Mitigation Act of 2000 (DMA 2000). The jurisdictions within Marshall County decided to join together to create a multi-jurisdictional plan under the guidance of the Marshall County Emergency Management Agency. In compliance with DMA 2000, the HMPC has reconvened annually for a review of the plan and then an extensive update process has been conducted every five years. The HMPC has met for the five-year updates of 2009, 2014, and 2019-2020.

Members of the committee included representatives from the participating jurisdictions, school officials, agency representatives, and other interested parties. The public has been welcomed to participate in all the meetings that have occurred since the very first HMPC meeting in 2003. During the meetings for the plan creation and updates, the participants provided vital information about their jurisdictions and agencies so that an accurate picture of the threats from hazards could be developed through the risk assessment. The necessary information was compiled from input from the participants as well as data from outside sources. This data, along with information on the jurisdiction's or agency's capabilities, was thoroughly examined and the mitigation measures for each community was developed.

Each Marshall County jurisdiction participated in this multi-jurisdictional planning process (see Appendix I Multi-Jurisdictional Participation Activities). Both the Town of Union Grove and Douglas passed a resolution allowing the Marshall County EMA to represent their towns on the HMPC.

2.0 Committee Meetings

Annual meetings were held by the HMPC between 2005 and 2018 to fulfill the requirements set forth in the plan maintenance section of the mitigation plans. Records on these meetings are on file in the EMA office. The planning process for the update to the 2014 Marshall County, Alabama Multi-Hazards Mitigation Plan began with 2 kick-off meetings, one in October 2019 and the second in November 2019. Ten meetings were held between October 2019 and February 2021. The COVID-19 outbreak of 2020 occurred during the planning process which impacted the scheduling of meetings. Individual meetings were conducted with the jurisdictions to facilitate information gathering. Those meetings took place between July 23 and August 7, 2020.

Participants were asked to complete exercises about hazards, their jurisdiction's capabilities and the status of their community action programs. During the hazard identification/risk assessment related meetings, participants were provided with a "Thoughts Sheet" to record their reflections on the hazards being discussed. They were asked to write down concerns, past events, mitigation ideas, or anything that came to mind while the hazard was discussed. A number of new mitigation measures that are included in this plan update were developed from the "Thoughts Sheet" and committee discussions. Once all preliminary exercises and meetings were complete, a new listing of mitigation measures, which included many of the previous measures, was analyzed by each jurisdiction and the mitigation strategies for the next 5 years were chosen.

Records of the meetings and completed exercises are maintained by the Marshall County EMA. The agendas and sign-in sheets are included in this appendix. For a more in-depth discussion of the composition and role of the HMPC, see Chapter 4 "Planning Process. "

3.0 Example Worksheets/Exercises

Included are examples of blank exercises/worksheets that were provided to the jurisdictions to complete. The implementation status worksheets were tailored to the jurisdictions. The example provided is specific for the Town of Douglas.

Hazard Identification Worksheet

Please fill out the tables based on your experience and knowledge of the listed hazards. The ratings below will help you fill out the tables. If you believe a hazard is not relevant please put N/A in the table.

Natural Hazards:

% Locations Affected – Please write what percentage of the jurisdiction would be affected by the hazard Less than 10%, 10-25%, 25-75%, 75-100%

Probability of the Hazard

- **Unlikely**: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.
- **Occasional**: 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
- **Likely**: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years
- **Highly Likely**: 90 to 100 percent probability of occurrence in the next year or a recurrence interval of less than 1 year.

Extent of Threat

- **Weak**: Resulting in little to no damage
- **Moderate**: Resulting in some damage and loss of services for days
- **Severe**: Resulting in devastating damage and loss of services for weeks or months
- **Extreme**: Resulting in catastrophic damage and uninhabitable conditions

Humanmade Hazards:

Degree of Concern

- **None**: Do not think about it
- **Low Level**: Consider it but do not believe it will happen
- **Moderate Level**: Think about the possibility of it occurring and is concerned that it can happen
- **High Level**: Very concerned about it happening

Impact

- **None**: No impact on the jurisdiction/agency
- **Low Level**: Minor interruption to or effect on services
- **Moderate Level**: Moderate interruption to or effect on services
- **High Level**: Severe interruption to or effect on services

Hazards Summary Worksheet

Jurisdiction/Agency: _____

Natural Hazard	% Location Affected	Probability of the Hazard	Extent of the Threat	Comments
Dam/Levee Failure				
Drought/Heat Waves				
Earthquake				
Erosion				
Extreme Cold				
Extreme Heat				
Flood - Flash				
Flood - Riverine				
Hail				
Hurricane				
Landslide				
Lightning				
Severe Storms				
Subsidence				
Tornado				
Wildfire				
Winter Storms/Freezes				

Humanmade Hazard	Degree of Concern	Impact	Concerns
Conventional bomb/improvised explosive device			
Biological agent			
Chemical agent			
Nuclear bomb			
Radiological agent			
Arson/incendiary attack			
Cyberterrorism			
Agriterrorism			
Armed Attack			
Chemical Spill			
Hazardous material release (intentional)			
Pandemic			
Industrial Accident (fixed facility)			
Industrial Accident (transportation)			
Failure of Supervisory Control and Data Acquisition system or other Critical Infrastructure Component			

Thoughts on Drought, Heat Waves, Sinkholes, Wildfires and Landslides

Please use the space below to provide information about drought, heat waves, sinkholes, wildfires and landslides within Marshall County that have occurred within the last **10** years. Information that will be helpful for the update of the Multi-Hazard Mitigation Plan includes: The hazard event, where the event occurred, when the event occurred, other hazards associated with it, the results of the event, and any suggestions you have to lessen the impact of the hazard.

IE ~ Severe Heat. Douglas, Alabama. July 2016. Temperatures between 95 and 105. Nursing home lost power. Emergency generators brought in due to their generators not working. Suggest routine maintenance of existing generators.

Capability Assessment Worksheet

Jurisdiction/Agency: _____

Local mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year
Comprehensive/Master Plan	
Capital Improvements Plan	
Economic Development Plan	
Local Emergency Operations Plan	
Continuity of Operations Plan	
Transportation Plan	
Stormwater Management Plan	
Community Wildfire Protection Plan	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation) -	

Building Code, Permitting, and Inspections	Yes/ No	Are codes enforced?
Building Code		
Building Code Effectiveness Grading Schedule (BCEGS) Score		
Fire department ISO rating		
Site plan review requirements		
Land Use Planning and Ordinances	**Yes/ No**	**Is the ordinance administered and enforced?**
Zoning ordinance		
Subdivision ordinance		
Floodplain ordinance		
Natural hazard specific ordinance (stormwater, steep slope, wildfire)		
Flood insurance rate maps		
Acquisition of land for open space and public recreation uses		
Other -		

Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Department/Agency and Position
Planning Commission		
Mitigation Planning Committee		
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)		
Mutual aid agreements		
Staff	**Yes/No FT/PT[1]**	**Department/Agency and Position**
Chief Building Official		
Floodplain Administrator		
Emergency Manager		
Community Planner		
Civil Engineer		
GIS Coordinator		
Other -		

1 Full-time (FT) or part-tim (PT) position

Technical	Yes/No
Warning systems/services (Reverse 911, outdoor warning signals)	
Hazard data and information	
Grant writing	
Hazus analysis	
Other -	

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/Eligibility (Yes/No)
Capital improvements project funding	
Authority to levy taxes for specific purposes	
Fees for water, sewer, gas, or electric services	
Impact fees for new development	
Storm water utility fee	
Incur debt through general obligation bonds and/or special tax bonds	
Incur debt through private activities	
Community Development Block Grant	
Other federal funding programs	
State funding programs	
Other -	

Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	
Natural disaster or safety related school programs	
StormReady certification	
Firewise Communities certification	
Public-private partnership initiatives addressing disaster-related issues	
Please list programs referenced above:	

Adapted from FEMA's Local Mitigation Planning Handbook
And Lehe Planning, LLC Questionnaires

Town of Douglas Mitigation Action Program

Goal, Objectives and Mitigation Measures	Lead Responsibility for Carrying Out Measure	Completed Yes/No	Reason not Completed: Ongoing Measure, Lack of Funding, Administrative Shortage, Lack of Political Support, Not Technically Feasible, No Legal Authority
Maintain up-to-date comprehensive plans for all jurisdictions. Each plan should address natural hazards exposure and include long term disaster resistance measures. The vulnerability and environmental suitability of lands for future development should be clearly addressed. Local plans should assess the vulnerability of designated hazard areas and encourage open space planning to create amenities for recreation and conservation of fragile resources.	Mayor and Council		
Examine regulatory options and feasibility of requiring open space areas for recreation, landscaping, and drainage control.	Mayor and Council		
Maintain a library of technical assistance and guidance materials to support the local floodplain manager.	Floodplain Manager		
Promote the adoption of uniform flood hazard prevention ordinance among all NFIP communities. The ordinance standards should encourage flood plain management that maintains the natural and beneficial functions of flood plains by maximizing the credits that could be obtained for “Higher Regulatory Standards” under the Community Rating System (CRS) Program.	Mayor and Council		
Participate in the “Turn Around Don’t Drown” program by purchasing and installing signs in known flash flood bridge overpass locations.	Mayor and Council		
Establish urban forestry program to help mitigate storm water runoff common in areas with large impervious surfaces.	Mayor and Council		
Support legislation to establish a State dam safety program.	Mayor and Council		
Apply for/maintain membership in the CRS Program; continue to upgrade rating.	Floodplain Manager		

Town of Douglas Mitigation Action Program

Goal, Objectives and Mitigation Measures	Lead Responsibility for Carrying Out Measure	Completed Yes/No	Reason not Completed: Ongoing Measure, Lack of Funding, Administrative Shortage, Lack of Political Support, Not Technically Feasible, No Legal Authority
Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards.	TBD		
Conduct wildfire vulnerability assessments, including the vulnerability of critical facilities and number of residential properties in these risk areas, and prepare a comprehensive inventory to identify high and moderate wildfire risk areas.	Fire Department		
Relocate buildings out of hazardous flood areas, with emphasis on pre-FIRM residential buildings, where deemed more cost effective than property acquisition or building elevation.	Mayor and Council		
Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	Mayor and Council		
Utilize the most recent NFIP repetitive loss property list, and other appropriate sources, to create and maintain a prioritized list of acquisition mitigation projects based on claims paid.	Mayor and Council		
Acquire and relocate or demolish structures located in Landslide Hazard Areas and enforce permanent restrictions after land acquisition and structure removal.	Mayor and Council		
Elevate certain buildings in flood prone areas where acquisition or relocation is not feasible, with emphasis on Pre-FIRM buildings; where feasible, elevation is preferable to flood proofing.	Mayor and Council		
Repair, elevate and weatherize existing homes for low- to moderate-income families.	Mayor and Council		
Flood proof pre-FIRM non-residential buildings, where feasible.	Mayor and Council		
Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	Mayor and Council		

Town of Douglas Mitigation Action Program

Goal, Objectives and Mitigation Measures	Lead Responsibility for Carrying Out Measure	Completed Yes/No	Reason not Completed: Ongoing Measure, Lack of Funding, Administrative Shortage, Lack of Political Support, Not Technically Feasible, No Legal Authority
Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.	Mayor and Council		
Promote the purchase of insurance coverage by property owners and renters for flood damages in high-risk areas.	Mayor and Council		
Promote the purchase of crop insurance to cover potential losses due to drought.	Mayor and Council		
Install lightning and/or surge protection on existing critical facilities.	Mayor and Council		
Conduct ongoing tree trimming programs along power lines.	TBD		
Install backup power generators for critical facilities.	Mayor and Council		
Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications and newspaper announcements.	Mayor and Council		
Continue to participate in environmental awareness events to provide the public information on hazard exposure and mitigation measures, such as City/County Day, Hurricane Awareness Week, and Severe Weather Week.	Mayor and Council		
Educate citizens on water saving techniques.	Mayor and Council		
Educate farmers on soil and water conservation practices.	Mayor and Council		
Arrange with the Multiple Listing Service (MLS) to require floodplain location disclosure as a condition for each real estate listing.	Mayor and Council		
Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.	Mayor and Council		

Town of Douglas Mitigation Action Program

Goal, Objectives and Mitigation Measures	Lead Responsibility for Carrying Out Measure	Completed Yes/No	Reason not Completed: Ongoing Measure, Lack of Funding, Administrative Shortage, Lack of Political Support, Not Technically Feasible, No Legal Authority
Distribute hazard mitigation brochures to students through area schools.	Mayor and Council		
Educate homeowners about structural and non-structural retrofitting of vulnerable homes.	Mayor and Council		
Distribute the 2014 plan to local officials, stakeholders, and interested individuals through internet download.	Mayor and Council		
Maintain appropriate media relationships to ensure the public is informed of hazard threats and means to mitigate property damages and loss of life.	Mayor and Council		
Promote the use of weather radios in households and businesses.	Mayor and Council		
Require the installation of weather radios in all public buildings and places of public assembly.	Mayor and Council		
Distribute weather radios and emergency response instructions to residents and businesses.	Mayor and Council		
Upgrade critical communications infrastructure.	Mayor and Council		
Increase open space acquisitions through the FEMA HMA Grant Programs and other flood plain acquisition efforts.	Mayor and Council		
Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.	Mayor and Council		
Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).	Mayor and Council		
Increase overall green spaces in cities by planting hurricane resistant trees with site and location taken into consideration.	Mayor and Council		

Town of Douglas Mitigation Action Program

Goal, Objectives and Mitigation Measures	Lead Responsibility for Carrying Out Measure	Completed Yes/No	Reason not Completed: Ongoing Measure, Lack of Funding, Administrative Shortage, Lack of Political Support, Not Technically Feasible, No Legal Authority
Enforce water use restrictions during periods of drought to conserve existing water supplies.	Mayor and Council		
Prepare and implement standard operating procedures and guidelines for drainage system maintenance.	Mayor and Council		
Construct drainage improvements to reduce or eliminate localized flooding in identified problem drainage areas.	Mayor and Council		
Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.	Mayor and Council		
Construct new community safe rooms in accessible locations and add safe rooms within new and existing public and institutional buildings, such as schools, colleges and universities, senior centers, community centers, hospitals, and government buildings.	Mayor and Council		
Encourage the construction of safe rooms in new and existing homes and buildings.	Mayor and Council		

4.0 Meeting Agendas and Sign-In Sheets

Meeting agendas and sign-in sheets are included in the information that follows.

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
LEPC Sub-Committee for All-Hazards Meeting
Marshall County Hazards Mitigation Plan/Threat Hazard Update
October 23, 2019

P. 1 of 2

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
PHILLIP	GOODSON	TOWN OF GRANT	256-728-2007	PGOODSON@GRANTAL.ORG
LEAH	KEITH	ARAB CITY SCHOOLS	256-586-6011	LKeith@arabcityschools.org
Candece	Adkins	ADPH / NAHCC	256-301-6749	candece.adkins@adph.state.al.us
Bo	McRee	GCBOE	256-264-5161	bomcree@gcboe.net
Allen	Johnson	Boaz City Schools	256-264-5017	ajohnson@boaz.k12.al.us
Joey	Baker	MC Comm.	(256)960-1181	jbaker@marshallco.org
GEORGE HARWELL	HARWELL	MC EMA	256-960-9567	GHARWELL@MARSHALLCO.ORG
Kim	Mayes	MCEMA	256-960-0678	Kmayes@Marshall.co.us
Will	Kennamer	MC EMA	256 960 9512	wkennamer@marshallco.org
Bob	Pirando	MCEngineer	256 570 0611	bpirando@marshallco.org
Ronny	Shumate	Marshall County Commission D-1	256 200-0718	rshumate@marshallco.org

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

LEPC Sub-Committee for All-Hazards Meeting
Marshall County Hazards Mitigation Plan/Threat Hazard Update

October 23, 2019

P. 2 of 2

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
Alan	Garner	Marshall Co. Schools	256-505-2296	garner.alan@marshallk12.org
Jimmy	Hopper	Marshall manor (Note: for Linda)	256-590-8179	Jhopper@Terracelakerc.com
Ph.1	Sims	MCSD	256-312-7324	psims@marshallcoun
Nick	Bonds	EMA		nbonds@marshallco.org

Kick-off Meeting
of
the Marshall County Multi-Hazard Mitigation Planning Committee
November 8, 2019

Call to Order

Introductions

2020 Multi-Hazard Mitigation Plan

What it is – regulations describing the original plan and updates
Why it is needed – in order to get funding in event of an emergency

What the roles of the participants will be – provide information on their jurisdictions/areas of expertise – I need to know how these hazards affect you. They affect people differently

Overview of the planning process – Have set meetings to discuss the findings as a group on events and on mitigation measures

- Kickoff Meeting
- Meeting 1 – Severe Storms/Tornadoes/Hurricanes/Flooding
- Meeting 2 – Droughts/Heatwaves/Wildfires/Sinkholes/Landslides
- Meeting 3 – Winter Storms/Earthquakes/Dam-Levee Failure
- Meeting 4 - Human-Made/Health Services/Hazardous Materials
- Meeting 5 – Mitigation Measures
- Meeting 6 – THIRA ~ Response and Recovery
- Community Meeting

Information gathering

Capabilities Assessment
Hazard Identification
Any information about hazard events in the last 5 years
Mitigation Review

Closing

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
Meeting – Multi Jurisdictional Hazard Mitigation Plan Update
November 7, 2019

Sign-in Sheet

Please Print Legibly

First Name	Last Name	Agency	Phone Number	E-Mail Address
JOEY	BAKER	COMM. DST 4	(256) 960-1181	jbaker@marshallco.org
GEORGE	HARWELL	MC EMA	256-960-9567	GHARWELL@MARSHALL CO. ORG
Celeste	Boydston	CPB Design Solutions	334-521-2509	cpbdesignsolutions@gmail.com
Ronny	Shumate	Comm. D-1	256.200.0718	rshumate@marshallco.org
Kay	Johnson	General Public	256-572-4027	kaymcj64@gmail.com
Allen	Johnson	Boaz City Schools	256-593-8180	ajohnson@boaz.k12.al.us
Stacey	White	Arab Electric	256-558-6438	Staceyarab-electric.org
Brad	Kitchens	Arab City Schools	256-586-6026	bkitchens@arabcityschools.org
PHILLIP	GOODSON	TOWN OF GRANT	256-728-2007	PGOODSON@GRANTAL.ORG
Nick	Bonds	MC EMA	(256) 960-9490	nbonds@marshallco.org
Kim	Mayes	MCEMA	256-960-0678	kmayes@Marshall Co.us

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

Marco
Arab
Guntersville

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
Meeting – Multi Jurisdictional Hazard Mitigation Plan Update
November 7, 2019
Sign-in Sheet

Please Print Legibly

First Name	Last Name	Agency	Phone Number	E-Mail Address
Bo	McRee	GCBOE	256-264-5161	bomcree@gcboe.net
Tim	Gilbert	MCBOE	256-960-9003	gilbert.tim@marshallK12.org
Nick	Borden	City of Boaz	256-960-0094	Nick.borden@cityofboaz.org
Drew	Gardner	City of Boaz	256-572-6008	drewgardner@cityofboaz.org
Will	Kennamer	MCEMA	256-571-7329	wkennamer@marshallco.org
Anita	McBurnett	MCEMA	256-571-7329	amcburnett@marshallco.org

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

Marshall County Multi-Hazard Mitigation Planning Committee

January 23, 2020 Agenda

Call to Order

Topic: Hazards and Their Risk

- Any questions from the kick-off meetings
- Gather remaining exercises from kick-off meeting
- Discussion on Hurricanes, Severe Storms, Tornadoes and Flooding

Remaining Meetings:

- Meeting 2 – Droughts/Heatwaves/Wildfires/Sinkholes/Landslides
- Meeting 3 – Winter Storms/Earthquakes/Dam-Levee Failure
- Meeting 4 - Human-Made/Health Services/Hazardous Materials
- Meeting 5 – Mitigation Measures
- Meeting 6 – THIRA ~ Response and Recovery
- Community Meeting

Questions

Closing

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

LEPC Sub-Committee for All-Hazards Meeting
Marshall County Hazards Mitigation Plan/Threat Hazard Update

January 23, 2020

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
Greg	Peppers	Albertville City Schools	256-264-3515	gpeppers@albertK12.org
JASON	BLANN	Albertville Fire	256-302-3502	jblann@cityofalbertville.com
Jared	Baker	Guntersville Fire	256-302-0030	jared.baker@guntersvillefire.org
Alan	Garner	Marshall Co. Schools	256-505-2296	garner.alan@marshallK12.org
Allen	Johnson	Boaz City Schools	256-593-8180	ajohnson@boazk12.org
Ronny	Shumate	Marshall County Commission	256 200-0118	rshumate@marshallco.org
LEAH	KEITH	ARAB CITY SCHOOLS	256-931-9260 653-9560	Lkeith@arabcityschools.org
Will	Kennamer	MCEMA	256 571 7329	wkennamer@marshallco.org
Buddy	Pettey	Guntersville Fire	256-558-0633	buddy.pettey@guntersvillefire.org
Nick	Bonds	MCEMA	256-960-9490	nbonds@marshallco.org

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

LEPC Sub-Committee for All-Hazards Meeting
Marshall County Hazards Mitigation Plan/Threat Hazard Update

January 23, 2020

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
Kay	Johnson	Independent	256-572-4027	Kaymc164@gmail.com
Celeste	Boydston	CPB Design Solutions	205 821 1024	Cpbdesignsolutions@gmail.com
Audra Ford	Ford	Marshall Health System	256 571 8109	audra.ford@mmcenters.com
Michael	Knop	Marshall County	256-571-7712	mknop@marshallco.org
Mark	Thompson	City of Albertville	256 891-8208	mthompson@cityofalbertville.com
Candece	Adkins	Healthcare Coalition Public Health	256-301-6749	candece.adkins@adph.state.al.us
BRAD	HIX	Aville Fire	256-891-6230	
BO	McRee	Guntersville City Schools	256-264-5161	On File
Brian	Waldrop	Guntersville Fire	256-302-3987	" "
Kim	Mayo	MCEMA	256-571-7324	" "

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

LEPC Sub-Committee for All-Hazards Meeting
Marshall County Hazards Mitigation Plan/Threat Hazard Update

January 23, 2020

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
Nick	Borden	City of Boaz	256-960-0094	Nick.borden@cityofboaz.org
Kenny	Smith	City of Boaz	256-251-0561	Kenny.Smith@CityofBoaz.org
George	Hartwell	MC EMA	256-571-7329	GHARTWELL@MARSHALLCO.ORG

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

LEPC Sub-Committee for All-Hazards Meeting
Marshall County Hazards Mitigation Plan/Threat Hazard Update

January 23, 2020

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
PHILLIP	GOODSON	GRANT	256-728-2007	PGOODSON@GRANTAL.ORG

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

Marshall County Multi-Hazard Mitigation Planning Committee

February 20, 2020 Agenda

Call to Order

Topic: Hazards and Their Risk

- Gather outstanding exercises/handouts
- Discuss items of interest from previous meetings
- Discussion on Heat Waves, Drought, Sinkholes, Wildfires, and Landslides

Remaining Meetings:

- Meeting 3 – Winter Storms/Earthquakes/Dam-Levee Failure
- Meeting 4 - Human-Made/Health Services/Hazardous Materials
- Meeting 5 – Mitigation Measures
- Meeting 6 – THIRA ~ Response and Recovery
- Community Meeting

Questions

Closing

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
LEPC-Sub-Committee for ALL-Hazards Meeting
Marshall County Hazards Mitigation Plan/Threat Hazard Update
February 20, 2020
Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
Phillip	Phillips	AFD	586-8813	RPhillips@cradockfy.org
Ronny	Shumate	Marshall Co Commission	256 706-5178	
Kay	Johnson		256-572-4029	kaymcjl4@gmail.com
Allen	Johnson	Boaz City Sch.	256-593-8180	ajohnson@boaz.k12.al.us
Jimmy	Hopper	Marshall Manor	256-590-8179	Jhopper@terracelakere.com
Michael	Knop	Marshall County	256-558-0916	mknop@marshallco.org
Rickey	Watson	Marshall Co Commission	256-760-7371	rwatson@marshallco.org
LEAH	KEITH	ARAB CITY SCHOOLS(W)	256-653-9560 931-3240	Lkeith@arabcityschools.org
Will	Kennemer	MCEMA	256 571 7329	wkennemer@marshallco.org
Kim	McCuiston	MCEMA	"	kmcpo@Marshallco.org
Drew	Gardner	Boaz City	(256)572-6008	drew.gardner@cityofboaz.org

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
LEPC-Sub-Committee for ALL-Hazards Meeting
Marshall County Hazards Mitigation Plan/Threat Hazard Update
February 20, 2020

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
Bo	McRee	Guntersville City Schools	256-264-5161	On File
Alan	Garner	Marshall County Schools	256-505-2296	garner.alan@marshallk12.org
PHILIP	GOODSON	GRANT	256-728-2007	PGOODSON@GRANTAL.ORG
Joey	Baker	Marshall Co	(256) 960-7180	jbaker@marshallco.org

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
LEPC-Sub-Committee for ALL-Hazards Meeting
Marshall County Hazards Mitigation Plan/Threat Hazard Update
February 20, 2020

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
JASON	BEARDEN	Albertville Fire		jbearden@cityofalbertville.com
Brad	Hix	Albertville Fire		bhix@cityofalbertville.com
Greg	Peppers	Albertville BCE		
Blake	Farmer	Boaz Fire		blake.farmer@CityofBoaz.org
Dusty	Walker	Forestry Commission	256-293-7880	dusty.Walker@forestry.Alabama.Gov
Michael	Williams	AL Forestry Commission	256-264-5613	michaelh.williams@forestry.alabama.gov
Celeste	Boydston			

Marshall County Multi-Hazard Mitigation Planning Committee

March 12, 2020 Agenda

Call to Order

Topic: Hazards and Their Risk

- Gather outstanding exercises/handouts
- Discuss items of interest from previous meetings
- Discussion on Winter Storms/Freezes, Earthquakes, Dam/Levee Failure

Remaining Meetings:

- Meeting 4 - Human-Made/Health Services/Hazardous Materials
- Meeting 5 – Mitigation Measures
- Meeting 6 – THIRA ~ Response and Recovery
- Community Meeting

Questions

Closing

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

LEPC Sub-Committee for All-Hazards Meeting
Marshall County Hazards Mitigation Plan/Threat Hazard Update

March 12, 2020

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
Joey	Baker	Dst 4 Comm.	(256)960-1181	jbaker@marshallco.org
Kay	Johnson	Albertville Independent	256-572-4027	Kay@dogpartypetservices.com
Allen	Johnson	Boaz City Schools	256-593-8180	ajohnson@boaz.k12.org
John	Berry	Arab City Schools	256-612-4213	jberry@arabcityschools.org
Shane	Washburn	Arab Police Dept	256-586-8124	ShaneWashburn@arabpd.com
Mark	Thompson	City of Albertville	256 891-8206	mthompson@cityofalbertville.com
Michael	Tucker	City of Albertville	256 302 3568	michael@cityofalbertville.com
Bo	McRae	GCBOE	256-264-5141	ON file
Dennis	Myers	Gsv P.D.	256-960-9794	dmyers@guntersvillepd.org

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

LEPC Sub-Committee for All-Hazards Meeting

Marshall County Hazards Mitigation Plan/Threat Hazard Update

March 12, 2020

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
Alan	Garner	Marshall Co. Schools	256-505-2296	garner.alan@marshallk12
Celeste	Boydston	CPB Design Solutions	205-821-1024	cpbdesignsolutions@gmail.com
Bob	Pinardo	Mar. Co. Eng	571.7712	BPinardo@marshallco.org
~~Darnell~~ Ryan	Darnell	GPD	571-7571	rdarnell@guntersville.pd.org
LEAH	[illegible]	ARAB CITY SCHOOLS	931-9260	[illegible]h@arabcityschools.org
GEORGE	HAPWELL	MCEMA	256-960-9561	GHAPWELL@MARSHALLCO.ORG
Kenny	Smith	City of Boaz	256-251-0561	Kenny.Smith@cityofboaz.org
Nick	Borden	City of Boaz	256-962-0094	Nick.borden@cityofboaz.org
Kim	Mayes	MCEMA	256-960-0678	kmayes@marshallco.org

Marshall County Multi-Hazard Mitigation Planning Committee

June 11, 2020 Agenda

Call to Order

Topic: Hazards and Their Risk

- Gather outstanding exercises/handouts
- Discuss items of interest from previous meetings
- Discussion on Human-Caused and Technological Hazards, Pandemics

Thoughts Sheet

Remaining Meetings:

- Meeting 5 – Mitigation Measures and Funding Options
- Meeting 6 – THIRA ~ Response and Recovery
- Community Meeting

Questions

Closing

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

LEPC Sub-Committee for All-Hazards Meeting
Marshall County Hazards Mitigation Plan/Threat Hazard Update

June 11, 2020

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
Alan	Garner	Marshall Co. Schools	256-505-2296	garner.alan@marshallk12.us
Jimmy	Hopper	Marshall Manor	256-509-8179	JHopper@TerraceLakerc.com
Greg	Dorsett	Guntersville Fire	256-558-6798	
Buddy	Pettry	Guntersville Fire/Rescue	256-302-3999	buddy.pettry@guntersvillefire.org
LEAH	KEITH	ARAB CITY SCHOOLS	256-931-9260	LKeith@arabcityschools.org
ANITA	McBURNett	MARSHALL County EMA	256-960-9480	amcburnett@marshallco.org
Nick	Borden	Boaz City	256-968-0094	Nick.borden@cityofboaz.org
Ronny	Shumate	Marshall County	256 200-0718	

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

LEPC Sub-Committee for All-Hazards Meeting
Marshall County Hazards Mitigation Plan/Threat Hazard Update

June 11, 2020

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
George	Hartwell	MC EMA	256-571-7329	GHARTWELL@MARSHALLCO.ORG
James Ricky	Watson	Commission	256-960-7371	rwatson@marshallco.org
Joey	Baker	Commission	(256) 960-1181	jbaker@marshallco.org
Bo	McRee	GCBOE	256-264-5161	bomcree@gcboe.net
Allen	Johnson	Boaz City Schools	256-593-8180	ajohnson@boaz.k12.al.us
Celeste	Boydston	CPB Design Solutions	334-521-2509	cpbdesignsolutions@gmail.com
Kim	Mayes	MCEMA	256-571-7329	kmayes@marshallco.org
Bob	Joslin	City of Arab	256-586-8128	bjoslin@arabcity.org
Brian	Walls	Guntersville Fire Rescue	256-677-3473	brian.walls@guntersvillefire.org

Remote Sign-in to Multi-Hazard Mitigation Plan Update
June 11, 2020

Phillip Goodson
Bob Pirando
Audra Ford

Marshall County Multi-Hazard Mitigation Planning Committee

July 9, 2020 Agenda

Call to Order

Presentation of the Mitigation Strategy Process

- Goals and Objectives
- Possible Mitigation Measures
- Evaluating the Measures
- Possible Funding Sources

One on One Meeting Dates:

- July 23 and 24 – Morning or Afternoon Session
- August 6 and 7 – Morning or Afternoon Session
- August 13 – Afternoon Session
- August 14 – Morning or Afternoon Session

Remaining Meetings:

- Meeting 6 – THIRA ~ Response and Recovery
- Community Meeting

Questions

Closing

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
Multi-Hazard Mitigation Plan Update Meeting
July 9, 2020

MARSHALL COUNTY EMA EMERGENCY MANAGEMENT AGENCY ALABAMA

Sign-in Sheet

Please Print Legibly

First Name	Last Name	Agency	Phone Number	E-Mail Address
James	Watson	Commission	256-960-7371	rwatson@marshallco.org
Kay	Johnson	Marshall Co. Animal Advocates	256-572-4027	kaymcaa@gmail.com
GEORGE	HARWELL	MC EMA	256-571-7329	GHARWELL@MARSHALLCO.ORG
Buddy	Petty	GFR	256-571-7575	buddy.petty@guntersvillefire.org
Brian	Walls	GFR	256-677-3473	brian.walls@guntersvillefire.org
Kim	Mayes	EMA	256 571-7329	kmayes@marshallco.us
Brian	Waldrop	GFR	256-302-3987	brian.waldrop@guntersvillefire.c

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
Multi-Hazard Mitigation Plan Update Meeting
July 9, 2020

MARSHALL COUNTY EMA EMERGENCY MANAGEMENT AGENCY ALABAMA

Sign-in Sheet

Please Print Legibly

First Name	Last Name	Agency	Phone Number	E-Mail Address
Joey	Staton	ARAH Ambulance	256-586-3111	Joey.Staton@DVGR.com
Bo	McRee	GCBOE	256-264-5161	bomcree@gcboe.net
Celeste ~~Boydston~~	Boydston	CPB Design	205 821 1024	cpbdesignsolutions@gmail.com
Wilson	Kennamer	MCEMA	256 571-7329	wkennamer@marshallco.org
~~JOEY BAKER~~	BAKER	Commission	(256) 960-7181	jbaker@marshallco.org

Remote Sign in to Multi-Hazard Mitigation Plan Update

Meeting 7/9/2020

Kim Mayes

Bob Pirando

Phillip Goodson

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
2020 Plan Mitigation Measures Meeting – Unincorporated Marshall County
July 23, 2020

MARSHALL COUNTY EMA EMERGENCY MANAGEMENT AGENCY ALABAMA

Sign-in Sheet

Please Print Legibly

First Name	Last Name	Agency	Phone Number	E-Mail Address
George	Harwell	MCEMA	256-571-7329	GHarwell@marshallco.org
James	Watson	Commission	256-690-7371	rwatsone marshallco.org
Bob	Pinarero	Engineer	256 573 0611	bpinarero@marshallco
JOEY	BAKER	Commission	(256) 960-1181	jbaker@marshallco.us
Celeste	Boydston	CPB Design Sol	(205) 821-1024	cpbdesignsolutions@gmail.com
Kay	Johnson	Marshall County Animal Advocates	256-572-4027	kaymcaa@gmail.com

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

Town of Grant Jurisdictional Meeting
July 23, 2020

Mayor Larry Walker
Phillip Goodson, Town Clerk
Emily Looney, Court Clerk
Celeste Boydston

City of Arab Jurisdictional Meeting
July 24, 2020

Mayor Bob Joslin
Stacey White
Shane Washburn
Chief Rick Phillips
Celeste Boydston

City of Guntersville Jurisdictional Meeting
August 6, 2020

Jim Hanson, Engineering
Brian Waldrop, Police Dept
Brian Walls, Fire Dept
Celeste Boydston

Albertville
Aug 7, 2020

Tracy Howea	Mayor City of Albertville	mayorhowea@cityofalbertville.com
Brad Hix	Fire Chief	bhix@cityofalbertville.com
Phyllis Webb	City Clerk	phyllis@cityofalbertville.com
Mark Thompson	Building Inspector	mthompson@cityofalbertville.com
Michael Tucker	Public Works	Michael@CityofAlbertville.com
Jason Beam	Asst. Fire Chief	jbeam@cityofalbertville.com
Michael Brewer	Purchasing/HR	mbrewer@cityofalbertville.com
Kay Johnson	Marshall County Animal Advocates	Kaymcaa@gmail.com
J.T. Carter	Asst. Chief of Police	jcarter@cityofalbertville.com
Robin Lathan	Asst. to the mayor	rlathan@cityofalbertville.com
James Smith	Police Chief	jsmith@cityofalbertville.com

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
2020 Plan Mitigation Measures Meeting – Boaz City
August 7, 2020

Sign-in Sheet

Please Print Legibly

First Name	Last Name	Agency	Phone Number	E-Mail Address
Nick	Borden	City of Boaz	256-960-0094	Nick.borden@CityofBoaz.org
Kenny	Smith	City of Boaz	256-251-2561	Kenny.Smith@cityofboaz.org
Blake	Farmer	City of Boaz	256-312-9020	blake.farmer@cityofboaz.org
George	Harwell	MCEMA	256-960-9567	GHARWELL@MARSHALLCO.ORG

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

MARSHALL COUNTY SCHOOLS
MULTI-HAZARD MITIGATION PLANNING COMMITTEE
July 30, 2020

Name	Email	School/District
Allen Delmore	adelmore@boe.k12.al.us	Boaz
Alan Garner	garner.alan@marshallk12.org	Marshall County
Bo McRee	bomcree@gcboe.net	GCBOE
Geoffrey Maxwell	GMAXWELL@MARSHALLCO.ORG	MCEMA
Celeste Boydston	cboodesignsolutions@gmail.com	—

Marshall County Multi-Hazard Mitigation Planning Committee

August 20 and September 24, 2020 Agenda

Call to Order

Topic: THIRA

- Why we are here
- What is THIRA
- Hazard Assessment
- General "Picture" of Marshall County
- Scenarios
- Capabilities Gap Analysis

Questions

Closing

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
2020 Plan Mitigation Measures Meeting – THIRA
August 20, 2020

Sign-in Sheet

Please Print Legibly

First Name	Last Name	Agency	Phone Number	E-Mail Address
Joey	Baker	Commission	960-1181	jbaker@marshallco.org
GEORGE	HARWELL	MC EMA	256-960-9567	GHARWELL@MARSHALLCO.ORG
Kay	Johnson	Marshall Co. Animal Advocate	256-572-4627	kaymcaa@gmail.com
M Stegall	Stegall	Division	256-586-3112	
Nick	Bonds	mc EMA	256-960-9490	nbonds@marshallco.org
Bo	McRee	GCBOE	256-264-5161	bomcree@gcboe.net
Allen	Vehlow	Boaz City Schools	256-593-8180	ajohnson@boaz.k12.us
Sean	Jepson	ArabPD	256-640-5399	corrections834@hotmail.com
James	Watson	Commission	256-960-7371	rwatson@marshallco.org
Jimmy	Hopper	Marshall manor	256-590-8179	Jhopper@TerraceLakesC.com
Buddy	Petty	GFR	256-302-3999	buddy.petty@guntersvillefire.org

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
2020 Plan Mitigation Measures Meeting – THIRA
August 20, 2020

Sign-in Sheet

Please Print Legibly

First Name	Last Name	Agency	Phone Number	E-Mail Address
Celeste	Boydston		334-521-2509	cpbdesignsolutions@gmail.com
Joey	Staton		256-584-3111	Joey.Staton@dvcr.com
Luke	Lathan		256-302-5656	llathan@cityofalbertville.com
Shane	Washburn		256-200-0607	shanewashburn820@gmail.com
Brian	Walls	GFD	256-677-3473	brian.walls@guntersvillefire.org
Kenny	Smith	Boaz Street	256-251-0561	Kenny.Smith@cityofboaz.org
Scott	Lacks	Ville PD	256-279-0632	
Anita	McBurnett	MCEMA	256-906-9480	amcburnett@marshallco.org

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
2020 Plan Mitigation Measures Meeting – THIRA
August 20, 2020

Sign-in Sheet

Please Print Legibly

First Name	Last Name	Agency	Phone Number	E-Mail Address
Jeff	Beck	Boaz FD	256-593-2321	jeff.beck@cityofboaz.org
Nick	Borden	City of Boaz	256-960-0094	Nick.borden@cityofboaz.org
STEPHEN	M^cLAMB	MCSO	256-571-2034	Smclamb@marshallco.org
Jordan	Moon	Arab EC	256-586-3196	Jordan@arab-electric.org

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
2020 Mitigation Plan Update Meeting
September 24, 2020

Sign-in Sheet

Please Print Legibly

First Name	Last Name	Agency	Phone Number	E-Mail Address
Celeste	Boydston	CPB Design Solutions	334-521-2509	cpbdesignsolutions@gmail.com
Bo	McRee	GCBOE	256-264-5161	bomcree@gcboe.net
Sean	Jepson	Arab PD	256-640-5399	corrections834@hotmail.com
Mike	Stegall	Arab Dispatch	265-509-2653	Mike.Stegall@VCR.com
Alan	Garner	MCBOE	256-505-2296	garner.alan@marshallk12.org
Nick	Bunds	MCEMA	256-960-9490	Nbonds@marshallco.org
LEAH	KEITH	ARAB BOE	C- 653-9560 256-931-9260	Lkeith@arabcityschools.org
Nick	Borden	City of Boaz	O-256-593-0241 C-256-960-0094	Nick.borden@cityofboaz.org
Kenny	Smith	City of Boaz	256-251-0561	Kenny.Smith@CityofBoaz.org
Jimmy	Hopper	Marshall Manor	256-590-8179	Jhopper@Terracelakerc.com
JOEY	BAKER	Commission	(256) 960-1181	Jbaker@marshall.org

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
2020 Mitigation Plan Update Meeting
September 24, 2020

Sign-in Sheet

Please Print Legibly

First Name	Last Name	Agency	Phone Number	E-Mail Address
Kim	Mayes	MCEMA	256 571- 7329	Kmayes@Marshallco.org
Joey	Staton	ARNG Division	256-590-2665	Joey.Staton@DVA.com
Ronny	Shumate	Marshall Court	256 200-0718	rshumate@marshallco.org
Kay	Johnson	Marshall Co Animal Advocates	256-572-4027	kaymcaa@gmail.com
Rick	Watson	~~Com~~ Commission	256-960-7371	rwatson@marshallco.org
GEORGE	HARWELL	MCEMA	256-960-9567	GHARWELL@MARSHALLCO.ORG
Bob	Pirando	MC Emp.	2565717712	bpirando@marshallco.org
ANITA	McBURNETT	MCEMA	256-960-9480	amcburnett@MARSHALLCO.ORG

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

Marshall County Multi-Hazard Mitigation Planning Committee

February 23, 2021 Agenda

Call to Order

Topic: Hazard Mitigation Plan Review

Discussion of any questions or concerns in relation to the draft of the plan.

Other Business

Closing

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
LEPC-Sub-Committee for ALL-Hazards Meeting
Marshall County Hazards Mitigation Plan/Plan Submittal For Approvals
February 23, 2021

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
Kay	Johnson	Marshall Co. Animal Advocates	256-572-4027	Kaymcaa@gmail.com
Rickey	Watson	Commission	256-960-7371	Rwatson@marshallco.org
Joey	Baker	Commission	(256) 960-1181	jbaker@marshallco.org
Alan	Garner	Marshall Co Schools	256-505-2296	garner.alan@marshall.k12.al.us
LEAH	KEITH	ARAB CITY SCHOOLS	256-931-9260	LKeith@arabcityschools.org
Ryan	Darnell	GPD	256 571 7571	rdarnell@guntersvillepd.org
Bob	Pirandolo	MC Emp.	256 571 7112	mcaemg@yahoo.com
BO	McRee	GCBOE	256-764-5161	bomcree@gcboe.net
Allen	Johnson	BCSS	256-593-8180	ajohnson@boaz.k12.al.us
Luke	Lathan	Albertville FD	256-302-5656	llathan@cityofalbertville.com
Brian	Walls	Guntersville Fire	256-677-3473	brian.walls@guntersvillefire.org

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY
LEPC-Sub-Committee for ALL-Hazards Meeting
Marshall County Hazards Mitigation Plan/Plan Submittal For Approvals
February 23, 2021

Sign-in Sheet

First Name	Last Name	Agency	Phone Number	E-Mail Address
Brian	Waldrop	Guntersville Fire	256-302-3987	brian.waldrop@guntersvillefire.org
Buddy	Petty	GFR	(256) 302-3999	buddy.petty@guntersvillefire.org
Kim	Mayes	EMA 6	256-960-0678	kmayes@marshallco.org
GEORGE	HARWELL	EMA	256-960-9567	GHARWELL@MARSHALLCO.ORG
Nick	Bands	EMA	256-960-9490	nbands@marshallco.org
Jim	Peterson	GPD	—	—
[illegible]	McBrayer	EMA	256-960-9480	[illegible]

MARSHALL COUNTY EMERGENCY MANAGEMENT AGENCY

Appendix H
Community Involvement Documentation

App. H - Community Involvement Documentation

1.0 Community Involvement Opportunities
2.0 Documentation

1.0 Community Involvement Opportunities

This Appendix includes additional documentation of the community involvement opportunities in the planning process for the Marshall County 2020 plan update. During the development of the plan update process, it was decided that a major push for public involvement would be instituted. The HMPC would make efforts to participate in public events held throughout the planning months in the different jurisdictions, such as the Hydrofest in Guntersville and the Marshall County Spring Fair. Most unfortunately, the COVID-19 outbreak occurred, and most public gatherings were suspended, limiting the ability for community involvement in the planning process. Even though public gatherings were cancelled, following is a list of ways in which the communities were able to participate in the planning process. (See Chapter 4 "The Planning Process" for a complete discussion of community involvement in the planning process)

1. The Marshall County Hazard Mitigation Planning Committee (HMPC). From the beginning, the public was offered the opportunity to attend the HMPC meeting and participate in discussions. The HMPC was established for the development of the original 2004 hazard mitigation plan, and has been overseeing all hazard mitigation planning activities and ensuring the plan's ongoing monitoring and implementation since that time. The HMPC represents all Marshall County jurisdictions, as well as interested stakeholder organizations, and meets at least annually. HMPC meetings were always open to the public. (For complete documentation of HMPC meetings, refer to Appendix G "Committee Meeting Documentation", and for a more detailed discussion of the HMPC, refer to Chapter 4 "The Planning Process").

2. The 2020 Marshall County Multi-Hazard Mitigation Plan Website. The website hazardmitigationplans.com was created to disseminate information and facilitate participation during the update process. The website provided meeting announcements and contained draft sections of the plan and encouraged public comments through a dedicated website email account along with surveys and comment forms. The most recently adopted plan is maintained on the Marshall County EMA website at http://www.marshallcoema.org.

3. Community Meetings. Presentation of the plan to the participating jurisdictions were done during community meetings that were held independently by each jurisdiction.

4. Interagency Involvement. Invitations to review the plan update on the website were sent to agencies and organizations representing neighboring counties, Federal and State governmental agencies, businesses, educational institutions and school boards,

and other interested private and non-profit stakeholders in the hazard mitigation planning process.

5. Public Hearings Prior to Adoption. The plan was formally adopted by the governing bodies of each jurisdiction after a final opportunity for public comment.

6. Marshall County EMA Community Relations. Community interest and involvement in the 2020 plan update was facilitated by the Director and staff of the Marshall County EMA, who have a longstanding record of strong and effective community relations.

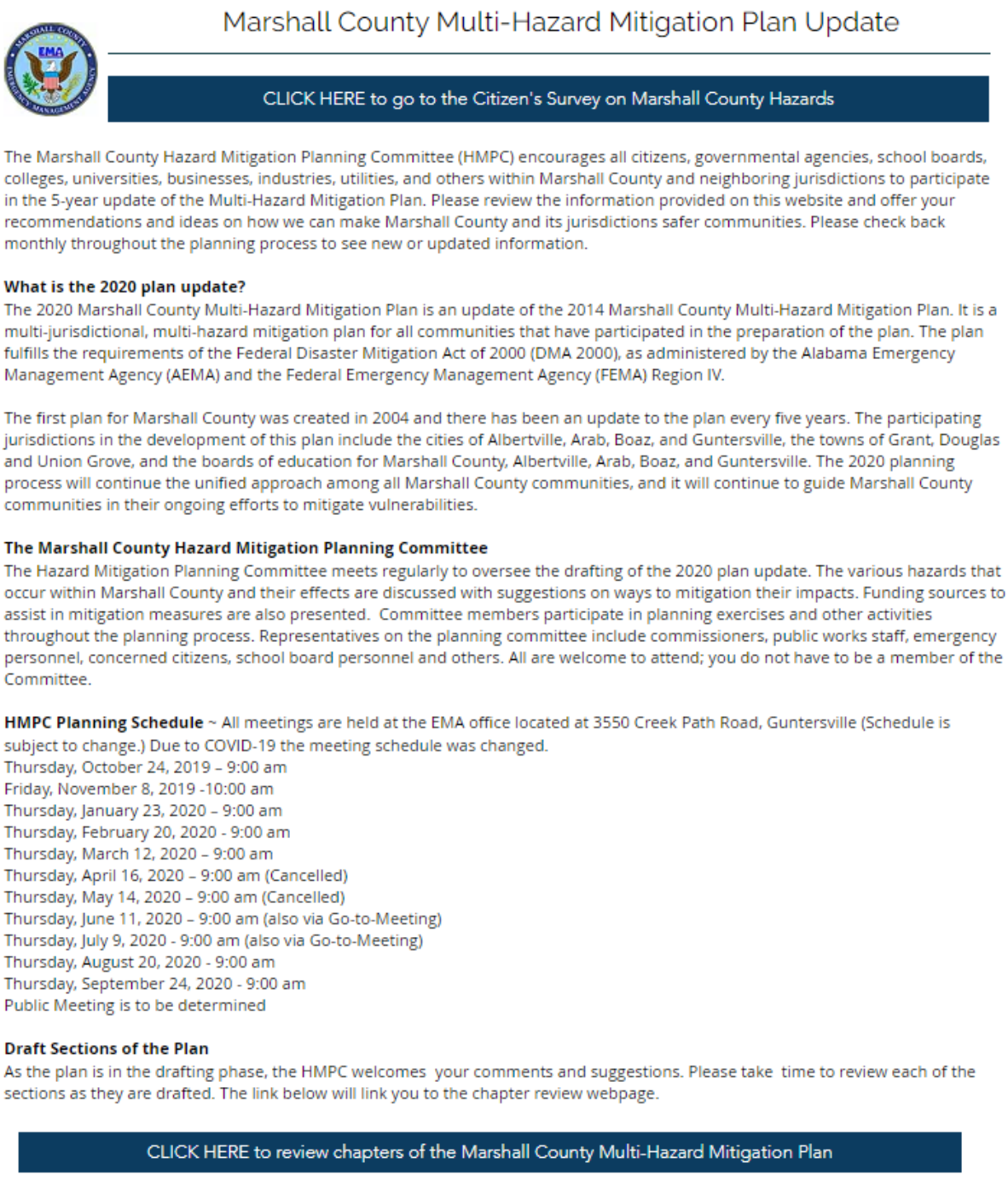
2.0 Documentation

This Appendix includes the following documentation of community involvement activities and opportunities:

- An image of the 2020 Marshall County Multi-Hazard Mitigation Plan update website at hazardmitigationplans.com.
- The email to media and others informing them about the plan update.
- The email inviting interested agencies, organizations, and stakeholders to participate in the planning process.
- The email to the media for a press release about the plan update's availability for review.
- The email invitation to interested agencies, organizations, and stakeholders to review the plan and provide feedback.
- A copy of the community survey which was available on the website for community members to express their concerns about the different hazards.
- A copy of the chapter review comments form.

Image of the 2020 Marshall County Multi-Hazard Mitigation Plan Website at marshall.hazardmitigationplan.com

Part 1 –



Marshall County Multi-Hazard Mitigation Plan Update

CLICK HERE to go to the Citizen's Survey on Marshall County Hazards

The Marshall County Hazard Mitigation Planning Committee (HMPC) encourages all citizens, governmental agencies, school boards, colleges, universities, businesses, industries, utilities, and others within Marshall County and neighboring jurisdictions to participate in the 5-year update of the Multi-Hazard Mitigation Plan. Please review the information provided on this website and offer your recommendations and ideas on how we can make Marshall County and its jurisdictions safer communities. Please check back monthly throughout the planning process to see new or updated information.

What is the 2020 plan update?
The 2020 Marshall County Multi-Hazard Mitigation Plan is an update of the 2014 Marshall County Multi-Hazard Mitigation Plan. It is a multi-jurisdictional, multi-hazard mitigation plan for all communities that have participated in the preparation of the plan. The plan fulfills the requirements of the Federal Disaster Mitigation Act of 2000 (DMA 2000), as administered by the Alabama Emergency Management Agency (AEMA) and the Federal Emergency Management Agency (FEMA) Region IV.

The first plan for Marshall County was created in 2004 and there has been an update to the plan every five years. The participating jurisdictions in the development of this plan include the cities of Albertville, Arab, Boaz, and Guntersville, the towns of Grant, Douglas and Union Grove, and the boards of education for Marshall County, Albertville, Arab, Boaz, and Guntersville. The 2020 planning process will continue the unified approach among all Marshall County communities, and it will continue to guide Marshall County communities in their ongoing efforts to mitigate vulnerabilities.

The Marshall County Hazard Mitigation Planning Committee
The Hazard Mitigation Planning Committee meets regularly to oversee the drafting of the 2020 plan update. The various hazards that occur within Marshall County and their effects are discussed with suggestions on ways to mitigation their impacts. Funding sources to assist in mitigation measures are also presented. Committee members participate in planning exercises and other activities throughout the planning process. Representatives on the planning committee include commissioners, public works staff, emergency personnel, concerned citizens, school board personnel and others. All are welcome to attend; you do not have to be a member of the Committee.

HMPC Planning Schedule ~ All meetings are held at the EMA office located at 3550 Creek Path Road, Guntersville (Schedule is subject to change.) Due to COVID-19 the meeting schedule was changed.
Thursday, October 24, 2019 – 9:00 am
Friday, November 8, 2019 -10:00 am
Thursday, January 23, 2020 – 9:00 am
Thursday, February 20, 2020 - 9:00 am
Thursday, March 12, 2020 – 9:00 am
Thursday, April 16, 2020 – 9:00 am (Cancelled)
Thursday, May 14, 2020 – 9:00 am (Cancelled)
Thursday, June 11, 2020 – 9:00 am (also via Go-to-Meeting)
Thursday, July 9, 2020 - 9:00 am (also via Go-to-Meeting)
Thursday, August 20, 2020 - 9:00 am
Thursday, September 24, 2020 - 9:00 am
Public Meeting is to be determined

Draft Sections of the Plan
As the plan is in the drafting phase, the HMPC welcomes your comments and suggestions. Please take time to review each of the sections as they are drafted. The link below will link you to the chapter review webpage.

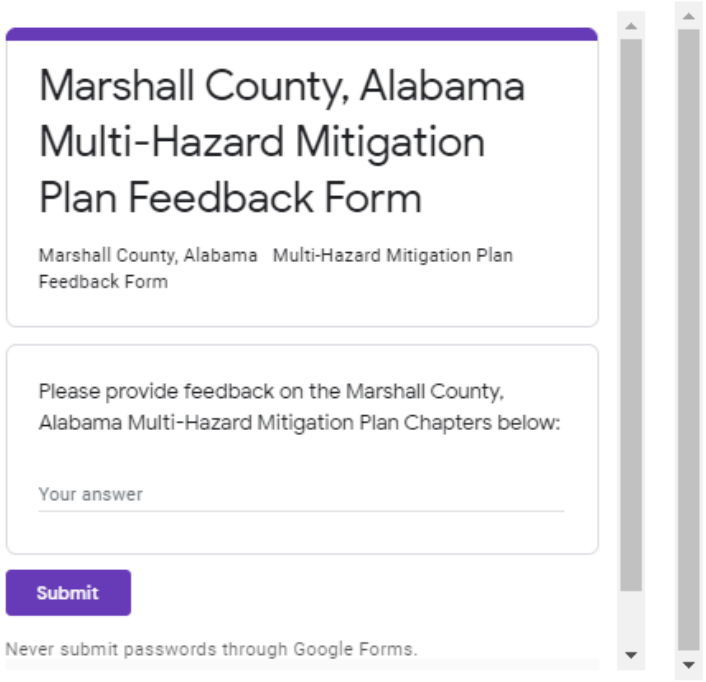
CLICK HERE to review chapters of the Marshall County Multi-Hazard Mitigation Plan

Part 2 –

Click on the chapter button to download corresponding chapters for the 2020 Marshall County Multi-Hazard Mitigation Plan. More chapters will be added so come back to see what's new. Feel free to provide feedback on the associated chapters. Thank you for your time.

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EXECUTIVE SUMMARY
CHAPTER 1 - INTRODUCTION
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CHAPTER 3 - COMMUNITY PROFILES
CHAPTER 4 - PLANNING PROCESS
CHAPTER 5 - RISK ASSESSMENT
CHAPTER 6 - MITIGATION STRATEGY
CHAPTER 7 - PLAN MAINTENANCE
APP A - FEDERAL REQUIREMENTS
APP B - COMMUNITY CAPABILITIES
APP C - 2014 IMPLEMENTATION
APP D - HAZARD RATINGS
APP E - HAZARD PROFILES
APP F - ALT. MITIGATION MEASURES
APP G - HMPC MTG DOCUMENTATION
APP H - COMMUNITY INVOLVEMENT
APP I - JURISDICTIONAL PARTICIPATION
APP J - ADOPTING RESOLUTIONS
VOL II - COMMUNITY ACTION PROGRAMS



Marshall County, Alabama Multi-Hazard Mitigation Plan Feedback Form

Marshall County, Alabama Multi-Hazard Mitigation Plan Feedback Form

Please provide feedback on the Marshall County, Alabama Multi-Hazard Mitigation Plan Chapters below:

Your answer

Submit

Never submit passwords through Google Forms.

Media Release about the Planning Process.

MARSHALL COUNTY
EMERGENCY MANAGEMENT AGENCY
Anita McBurnett, Director

October 29, 2019

Press Release - Mitigation Plan Update

A meeting to discuss and kickoff the update of the Marshall County Multi-Hazard Mitigation Plan is scheduled to be held at 10:00 AM Friday November 8, 2019 at the Marshall County Emergency Management Agency located at 3550 Creek Path Road in Guntersville.

The plan is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000) and must be updated every five years in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs.

The plan is due for its 5-year review and update, and a timely update and approval of the plan is required in order for jurisdictions to remain eligible for mitigation grant funding, hazard mitigation assistance and disaster declaration assistance. Plans must be updated every 5 years in order for jurisdictions to remain eligible.

But more importantly, to be eligible for future FEMA assistance, jurisdictions must be an active participant in planning, updating and adopting the approved mitigation plan.

The mitigation plan describes the major hazards that poses significant risk to the county, including historical background vulnerability, exposure and potential loss needed to assist communities with development activities and issues prior to a disaster, insuring participation in a more pro-active sense. Active hazard mitigation in a community contributes to public safety and welfare, economic development and environmental protection needs.

Development of the plan is under direction of the county's emergency manager in cooperation with a planning team of representatives from the county, cities, towns, school districts, and other key stakeholders such as utility providers, local industry, hospitals, health care facilities and input from the public.

According to Marshall County Emergency Management Director Anita McBurnett "Hazard mitigation planning is a central part of our emergency management program. Understanding the hazards that can impact our communities and taking action to reduce or eliminate the impact makes us more resilient. Hazard mitigation helps to break the cycle of damage and repair caused by events like severe weather, flooding, ice storms, and other events that damage property, stress economies, and threaten life safety in our county."

Examples of hazard mitigation include actions such as improvement of roads and culverts that experience repetitive flooding; construction of safe rooms to protect lives in the event of tornados or severe wind events; burying powerlines that may fail due to heavy snow, ice or wind storms; ensuring timely emergency communication to the public through mass notification systems; and conducting public awareness and education campaigns to help people to be prepared to take safe action before, during, or after a hazardous event.

MARSHALL COUNTY EMA - 3550 Creek Path Road - Guntersville, Alabama 35976 - (256) 571-7329

MARSHALL COUNTY
EMERGENCY MANAGEMENT AGENCY
Anita McBurnett, Director

Public feedback is encouraged. As part of the planning process, gathering input from the public is an important and required step. The planning team seeks to gather feedback from residents and businesses across the county to incorporate into the planning process.

Questions regarding the planning process may be directed to Anita McBurnett at the Marshall County Emergency Management office 256-571-7329.

Anita McBurnett

Anita McBurnett, Director
Marshall County EMA
3550 Creek Path Road
Guntersville, Alabama 35976
256-571-7329 Office
256-960-9480 Cell

Current Planning Team Members

Alabama Department of Public Health - Candece Adkins
Albertville City - Mark Thompson
Albertville City Schools - Tim Tidmore
Arab City - Dameon Pittenger
Arab City Schools - Leah Keith
Boaz City - Kenny Smith
Boaz City - Nick Borden
Boaz City Schools - Allen Johnson
Guntersville City - Jimmy Hanson
Guntersville City Schools - Bo McRee
Marshall County Commission - Bob Pirando
Marshall County EMA - Anita McBurnett
Marshall County EMA - George Harwell
Marshall County Schools - Alan Garner
Marshall Manor - Linda Robertson
Marshall Medical Centers - Jacob Babb
Snead State - Joe Whitmore
Snead State - Paul Gore
Snead State - Steve Williams
Town of Douglas - Carolyn Garrett
Town of Grant - Phillip Goodson
Town of Union Grove - Sarah Bunch

Email invitation to area organizations to attend the HMPC Meetings:

From: George Harwell <gharwell@marshallco.org>
Sent: Monday, August 5, 2019 10:34 AM
To:
Cc: 'Anita McBurnett' <amcburnett@marshallco.org>
Subject: Invitation, LEPC Sub Committee for All Hazards
Importance: High

The Marshall County Local Emergency Planning Committee (LEPC) would like to extend membership invitation to one or more representatives of the following organizations to join the LEPC Mitigation Planning Sub-Committee for All Hazards:

- All skilled health care facilities in Marshall County to include hospitals, assisted living, nursing homes, and hospice;
- The Marshall County Fire Association; and,
- The Marshall County Manufacturers Association.

A meeting of the LEPC Sub-Committee for All Hazards will be called in the near future to start the review and update of the Marshall County Multi-Hazard Mitigation Plan. The committee is currently composed of representatives from the county, cities, towns and school systems within Marshall County, and department of public health.
The Marshall County 2014 Multi-Hazard Mitigation Plan is due for its 5-year review and update, and a timely update and approval of the plan is required in order for jurisdictions to remain eligible for mitigation grant funding and hazard mitigation assistance.
But more importantly, to be eligible for FEMA Disaster Assistance, you must be a participant in the approved Mitigation Plan.
The All Hazards Sub-Committee is responsible for reviewing the Marshall County Multi-Hazard Mitigation Plan annually, or more frequently if required, and keeping the plan updated and current. The mitigation plan describes the major hazards that poses significant risk to the county, including historical background vulnerability, exposure and potential loss needed to assist communities with development activities and issues prior to a disaster, insuring participation in a more pro-active sense. Active hazard mitigation in a community contributes to public safety and welfare, economic development and environmental protection needs.
Prior to the initial sub-committee meeting, it is recommended everyone become familiar with the 2014 Multi-Hazard Mitigation Plan.
Copies of the approved 2014 plan are available at Marshall County EMA on CD as the document is too large to email. If needed, please call me.
Participation of your organization is highly encouraged.
George Harwell, Operations Specialist
Marshall County Emergency Management Agency
3550 Creek Path Road
Guntersville AL 35976
Phone: 256-571-7329
Fax: 256-571-7388
Email: gharwell@marshallco.org
www.marshallcoema.org

Email Request for Publication about the Hazard Mitigation Plan Update:

From: George Harwell <gharwell@marshallco.org>
Sent: Monday, December 2, 2019 2:30 PM
To: david.goodlifemagazine@gmail.com
Subject: Publication Request
Importance: High

Mr. David Moore,

The Marshall County Emergency Management Agency would like to publish an article in Good Life Magazine on the current activity to update the county's multi-jurisdiction multi-hazard mitigation plan.

The attached press release provides an overview of the activity which will involve representatives from cities, towns, boards of education, various county agencies and other stakeholders in Marshall County.

It is also important during the activity to inform and engage the public and provide opportunity for feedback.

Please let me know if your publication in interested in publishing an article and if so the deadline for upcoming publication dates.

George Harwell, Operations Specialist
Marshall County Emergency Management Agency
3550 Creek Path Road
Guntersville AL 35976
Phone: 256-571-7329
Fax: 256-571-7388
Email: gharwell@marshallco.org
www.marshallcoema.org

Email Request for Publication about the Hazard Mitigation Plan Update:

From: George Harwell <gharwell@marshallco.org>
Sent: Monday, December 2, 2019 2:33 PM
To: contact@lakecityalabama.com
Subject: Publication Request
Importance: High

Mr. Patrick Oden,

The Marshall County Emergency Management Agency would like to publish an article in Lake City Magazine on the current activity to update the county's multi-jurisdiction multi-hazard mitigation plan.

The attached press release provides an overview of the activity which will involve representatives from cities, towns, boards of education, various county agencies and other stakeholders in Marshall County.

It is also important during the activity to inform and engage the public and provide opportunity for feedback.

Please let me know if your publication in interested in publishing an article and if so the deadline for upcoming publication dates.

George Harwell, Operations Specialist
Marshall County Emergency Management Agency
3550 Creek Path Road
Guntersville AL 35976
Phone: 256-571-7329
Fax: 256-571-7388
Email: gharwell@marshallco.org
www.marshallcoema.org

Email Request for Publication about the Hazard Mitigation Plan Update:

Sent: Monday, December 2, 2019 2:23 PM
To: contact@alabamaliving.coop
Subject: Publication Request
Importance: High

Ms. Lenore Vickrey,

The Marshall County Emergency Management Agency would like to publish an article in your magazine Alabama Living on the current activity to update the county's multi-jurisdiction multi-hazard mitigation plan.

The attached press release provides an overview of the activity which will involve representatives from cities, towns, boards of education, various county agencies and other stakeholders in Marshall County.

It is also important during the activity to inform and engage the public and provide opportunity for feedback.

Please let me know if your publication in interested in publishing an article and if so the deadline for upcoming publication dates.

George Harwell, Operations Specialist
Marshall County Emergency Management Agency
3550 Creek Path Road
Guntersville AL 35976
Phone: 256-571-7329
Fax: 256-571-7388
Email: gharwell@marshallco.org
www.marshallcoema.org

Email to the media from the EMA Director about the ability to review the plan online:

MARSHALL COUNTY
EMERGENCY MANAGEMENT AGENCY
Anita McBurnett, Director

February 26, 2021

PRESS RELEASE
Marshall County Multi-Hazard Mitigation Plan Update 2020

The Marshall County Multi-Hazard Mitigation Plan has been updated and is available for final review by the public and all stakeholders to include the county, cities, towns, school districts, utility providers, local industry, hospitals, health care facilities and all other interested parties.

The plan is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000) and must be updated every five years in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs.

The 2020 Multi-Hazard Mitigation plan is in final format prior to submittal for approval and available for review and comment online at hazardmitigationplans.com/marshall-county-chapters.

The mitigation plan describes the major hazards that poses significant risk to the county, including historical background vulnerability, exposure and potential loss needed to assist communities with development activities and issues prior to a disaster, insuring participation in a more pro-active sense. Active hazard mitigation in a community contributes to public safety and welfare, economic development and environmental protection needs.

Per Marshall County Emergency Management Director Anita McBurnett "Hazard mitigation planning is a central part of our emergency management program. Understanding the hazards that can impact our communities and taking action to reduce or eliminate the impact makes us more resilient. Hazard mitigation helps to break the cycle of damage and repair caused by events like severe weather, flooding, ice storms, and other events that damage property, stress economies, and threaten life safety in our county."

Public feedback is encouraged.

Questions regarding the plan may be directed to Anita McBurnett at the Marshall County Emergency Management office 256-571-7329.

Anita McBurnett
Anita McBurnett, Director
Marshall County EMA
3550 Creek Path Road
Guntersville, Alabama 35976
256-571-7329 Office
256-960-9480 Cell

MARSHALL COUNTY EMA - 3550 Creek Path Road - Guntersville, Alabama 35976 - (256) 571-7329

Email to area agencies from the planning team about the ability to review the plan online and to submit comments:

From: George Harwell <gharwell@marshallco.org>
Date: Wed, Mar 3, 2021 at 10:09 AM
Subject: Final Review, Marshall County AL Multi-Hazard Mitigation Plan
To:

To all concerned:

We have concluded the drafting of the update to the 2020 Marshall County Multi-Hazard Mitigation Plan and are inviting you to review the plan and provide any additional information or comments you may have pertinent to the plan.

The Marshall County Hazard Mitigation Planning Committee met from October 2019 through February 2021 to update the 2014 plan and are ready to submit it to the state EMA office for their review and approval

You can find the entire plan at hazardmitigationplans.com/marshall-county-chapters and may provide feedback through the feedback form that can be found on the main chapter page of the website.

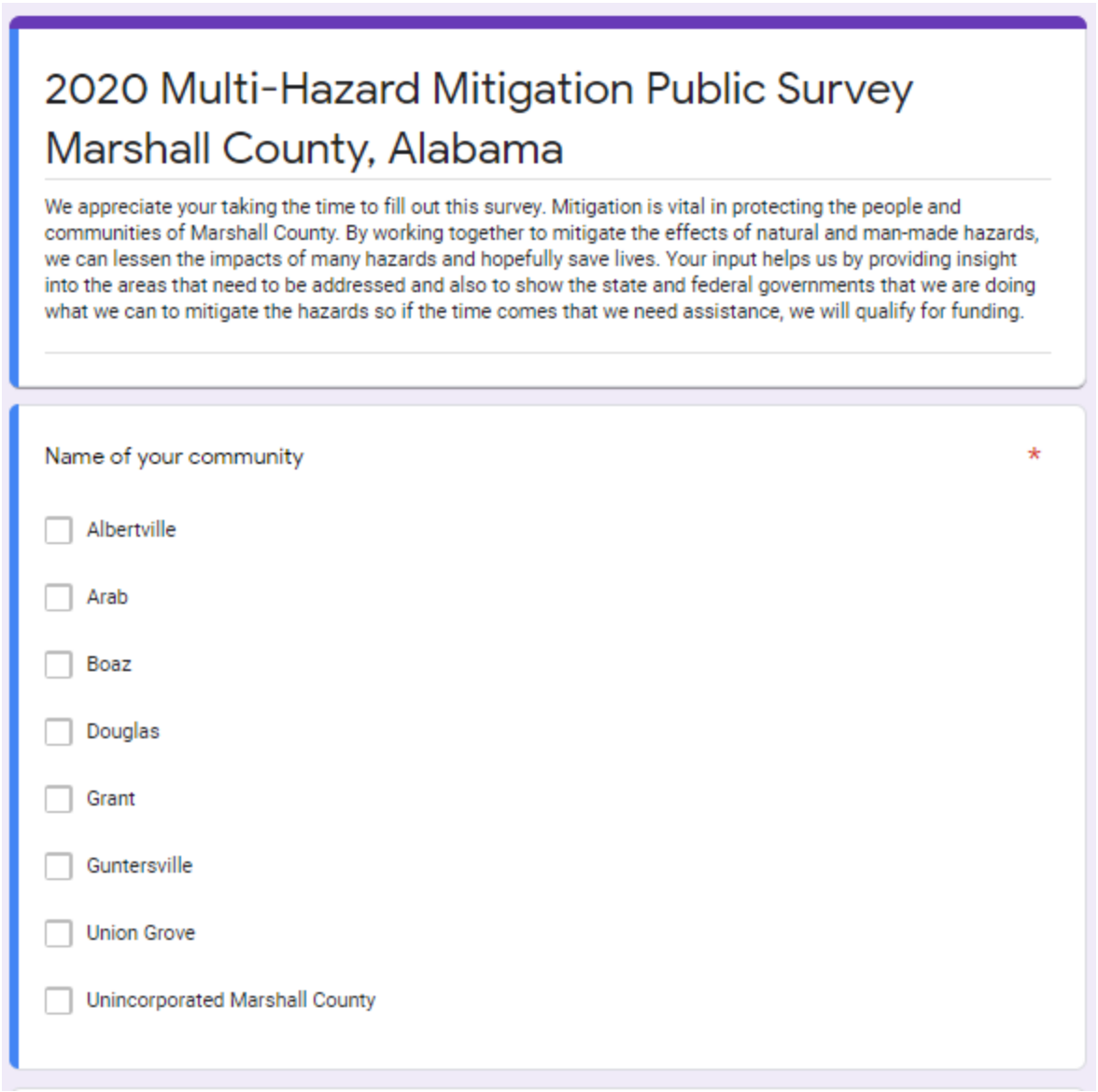
Feel free to submit any questions to me at this email address or Anita McBurnett, Director of Marshall County EMA at amcburnett@marshallco.org.

We need all feedback by March 15th. Thank you for your time.

Celeste Boydston
Plan Coordinator
CPB Design Solutions, LLC
663 Anders Court
Auburn, AL 36830

A copy of the community survey which was available on the website for community members to express their concerns about the different hazards.

Part 1 –



2020 Multi-Hazard Mitigation Public Survey
Marshall County, Alabama

We appreciate your taking the time to fill out this survey. Mitigation is vital in protecting the people and communities of Marshall County. By working together to mitigate the effects of natural and man-made hazards, we can lessen the impacts of many hazards and hopefully save lives. Your input helps us by providing insight into the areas that need to be addressed and also to show the state and federal governments that we are doing what we can to mitigate the hazards so if the time comes that we need assistance, we will qualify for funding.

Name of your community *

- [ ] Albertville
- [ ] Arab
- [ ] Boaz
- [ ] Douglas
- [ ] Grant
- [ ] Guntersville
- [ ] Union Grove
- [ ] Unincorporated Marshall County

Part 2 -

Mark all the hazards that affect your community. *

- [ ] Flood
- [ ] Tornadoes
- [ ] Earthquakes
- [ ] Wildfires
- [ ] Landslides
- [ ] Winter Storms
- [ ] Severe Storms
- [ ] Hurricanes
- [ ] Dam Failure
- [ ] Drought
- [ ] Sinkholes
- [ ] Heat Waves
- [ ] Pandemics
- [ ] Cyberterrorism
- [ ] Terrorist Attack
- [ ] Active Shooter
- [ ] Chemical Spill at a fixed location
- [ ] Chemical Spill during transport
- [ ] Other...

Part 3 -

Do you have any specific concerns about any of the above hazards?

Long answer text

Do you have any suggestions on how to mitigate (lessen) the impacts of the hazards?

Long answer text

THANK YOU FOR YOUR

Description (optional)

A copy of the chapter review comments form from the website.

Marshall County, Alabama Multi-Hazard Mitigation Plan Feedback Form

Marshall County, Alabama Multi-Hazard Mitigation Plan Feedback Form

Please provide feedback on the Marshall County, Alabama Multi-Hazard Mitigation Plan Chapters below:

Your answer

Submit

Appendix I
Multi-Jurisdictional Participation Activities

App. I –Multi-Jurisdictional Participation Activities

1.0 Participation Opportunities
2.0 Participation Documentation

1.0 Participation Opportunities

Table I-1, "Multi-Jurisdiction Participation Activities" illustrates each jurisdiction's participation within Marshall County in the plan update process; therefore, qualifying the plan as a Multi-Jurisdictional Plan. According to 44 CFR Section 201.6(a)4, "Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process…"

Beginning with the kick-off meeting on October 23, 2019, to the adoption of the plan, each jurisdiction was provided the ability to participate in the plan update process. A majority of the planning process took place during 2020 at the peak of the COVID-19 pandemic. The planning process took longer than expected due to postponed meetings moving the completion by a couple of months. Precautions were taken when meetings took place in person, and opportunities to attend via Go-to-Meeting were provided for two sessions. In order to get the best feedback during the crisis, one-on-one meetings with the jurisdictions were also held during the mitigation strategy section of the plan. A total of 10 meetings were held with the HMPC as a whole and 7 were held with single jurisdictions including the school boards. Whenever a jurisdiction's representative was unable to attend a meeting, meeting materials were forwarded to that representative so they would have every opportunity to participate.

At the beginning of the planning process the plan administrator met with the towns of Doulas and Union Grove individually since they would be unable to attend meetings in person due to limited staffing. After those two meetings, Union Grove and Douglas were represented at meetings by the Marshall County EMA through passage of a resolution of representation.

All jurisdictions but Douglas and Union Grove participated in a one-one-one meeting with the plan administrator during the mitigation strategy section of the planning process. The jurisdictions were provided with a series of dates in which to schedule a meeting with the plan administrator to discuss what the mitigation strategies section entails. This afforded many officials who were unable to make the HMPC meetings the opportunity to participate in the selection of mitigation strategies so they could be ensured the mitigation strategies that were included in the plan were the ones they wanted for their communities and schools.

2.0 Participation Documentation

Tables I-1 and I-2 are a summary of the dates of the meetings and activities for each meeting and which jurisdiction participated. An X indicates the events in which the jurisdiction chose to participate. Conclusions of the activities are shown in Appendices B through F, and information on the meetings is included in Appendices G and H. The towns of Union Grove and Douglas were represented by the Marshall County EMA through an authorized representation resolution. The Town of Douglas's representative provided feedback on some activities but was unable to attend in person.

Table I-3 shows the participation by school representatives at the various meetings.

Table I-1. Meeting Attendance by Jurisdictions

Multi-Jurisdictional Participation Meeting Attendance Marshall County 2020 Plan Update	Marshall Co.	Albertville	Arab	Boaz	Guntersville	Douglas *	Grant	Union Grove *
Kick-off Meeting 1 – October 23, 2019	X		X	X	X		X	
Kick-off Meeting 2 – November 8, 2019	X		X	X	X		X	
Meeting 3 - January 23, 2020	X	X	X	X	X		X	
Meeting 4- February 20, 2020	X	X	X	X	X		X	
Meeting 5 - March 12, 2020	X	X	X	X	X			
Meeting 6 - June 11, 2020	X		X	X	X		X	
Meeting 7 - July 9, 2020	X		X	X	X		X	
Meeting 8 - August 20, 2020	X		X	X	X			
Meeting 9 - September 24, 2020	X		X	X	X			
Meeting 10 – February 23, 2021	X	X	X	X	X			
One-On-One Jurisdictional Meetings	X	X	X		X			

* Union Grove and Douglas were represented by the Marshall County EMA through an authorized representation resolution passed by their town councils.
(X) – Indicates direct participation in the meeting

Table I-2. Multi-Jurisdictional Participation Activities

Multi-Jurisdictional Participation Activities Marshall County 2020 Plan Update	Marshall Co.	Albertville	Arab	Boaz	Guntersville	Douglas *	Grant	Union Grove *
Capabilities	X	X	X	X	X	X	X	
Hazard Identification	X	X	X	X	X	X	X	
Implementation Status	X	X	X	X	X	X	X	X
Mitigation Measures Pare Down Listing	X	X	X	X	X		X	
Mitigation Measures Ranking	X	X	X	X	X	X	X	X
Thought Sheets	X	X	X	X	X		X	

* Union Grove and Douglas were represented by the Marshall County EMA through an authorized representation resolution passed by their town councils.
(X) – Indicates participation in the activity

Table I-3. Meeting Attendance by School Representatives

School Representative Meeting Attendance Marshall County 2020 Plan Update	Marshall Co.	Albertville	Arab	Boaz	Guntersville
Kick-off Meeting 1 – October 23, 2019	X		X	X	X
Kick-off Meeting 2 – November 8, 2019	X		X	X	X
Meeting 3 - January 23, 2020	X	X	X	X	X
Meeting 4- February 20, 2020	X	X	X	X	X
Meeting 5 - March 12, 2020	X		X	X	X
Meeting 6 - June 11, 2020	X		X	X	X
Meeting 7 - July 9, 2020					X
Special Mitigation Meeting July 30,2020	X		X*	X	X
Meeting 8 - August 20, 2020	X		X	X	X
Meeting 9 - September 24, 2020	X				X
Meeting 10 – February 23, 2021	X		X	X	X

* The representative from Arab City Schools was unable to attend the special meeting; however, she did complete the paperwork in relation to the mitigation measures.

Appendix J
Adopting Resolution

App. J – Adopting Resolution

1.0 Purpose
2.0 Sample Adopting Resolution

1.0 Purpose

The resolution in the following section is a sample adopting resolution for the participating jurisdictions which can be used as an example for the governing bodies to formally adopt the 2020 plan update following a public hearing. The resolutions from the jurisdictions that adopted this plan are on file with the AEMA and FEMA and also can be found at the Marshall County EMA office.

2.0 Sample Adopting Resolution

RESOLUTION OF THE (GOVERNING BODY)

A RESOLUTION ADOPTING THE 2020 MARSHALL COUNTY MULTI-HAZARD MITIGATION PLAN, IN FULFILLMENT OF THE FEDERAL DISASTER MITIGATION ACT OF 2000 AND THE LOCAL MITIGATION PLAN REQUIREMENTS OF 44 C.F.R. SECTION 201.6 AND FEMA LOCAL MULTI-HAZARD MITIGATION PLANNING GUIDANCE

WHEREAS, The Federal Disaster Mitigation Act of 2000 (DMA 2000), as administered by the Alabama Emergency Management Agency (AEMA) and the Federal Emergency Management Agency (FEMA) provides Federal assistance to local governments to alleviate suffering and damage from disasters, and broadens existing relief programs to encourage disaster preparedness plans and programs, coordination and responsiveness, insurance coverage, and hazard mitigation measures; and,

WHEREAS, the DMA 2000 requirements for local mitigation plans are set forth in 44 C.F.R. Section 201.6 and the Local Mitigation Planning Handbook, FEMA, March 2013; and,

WHEREAS, as a prerequisite for each Marshall County jurisdiction to continue to qualify for FEMA mitigation grant assistance programs, the DMA 2000 requires the five year update of the 2014 Marshall County Multi-Hazard Mitigation Plan, which was approved by FEMA on January 1, 2015; and,

WHEREAS, the AEMA had awarded a $20,000.00 planning grant funded through the FEMA Hazard Mitigation Grant Program (HMGP) to the Marshall County Commission to fund 75% of the total cost of the five year plan update for all jurisdictions within Marshall County; and,

WHEREAS, the 2020 Marshall County Multi-Hazard Mitigation Plan has been prepared in accordance with DMA 2000 requirements under the direction of the Marshall County Hazard Mitigation Planning Committee with the support of the Marshall County EMA, on behalf of all of the jurisdictions within Marshall County; and,

WHEREAS, said mitigation plan addresses all natural, human-caused and technological hazards deemed to threaten property and persons within the unincorporated and incorporated areas of Marshall County; and,

WHEREAS, the Federal planning criteria require formal adoption of the FEMA-approved plan update by each participating jurisdiction.

NOW THEREFORE, BE IT RESOLVED that the 2020 Marshall County Multi-Hazard Mitigation Plan is hereby adopted and immediately made effective.

ADOPTED this the _____ day of _____, 2021.

APPROVED: _____

ITS: _____

ATTEST: _____

ITS: _____

Volume III
Marshall County
Community Action Programs

Community Action Programs

1.0 Development of Community Action Programs
2.0 Community Action Programs for Each Jurisdiction

1.0 Development of Community Action Programs

The Community Action Programs are a listing of the mitigation measures the individual jurisdictions chose to pursue over the next five years. The representatives reviewed the list of measures provided during the one-on-one meetings and selected the measures that were deemed applicable after a thorough evaluation.

The original list of mitigation measures was based on the previous measures from the 2014 Marshall County, Alabama, Multi Hazard Mitigation Plan, the 2018 Alabama State Hazard Mitigation Plan, and suggestions from the Hazard Mitigation Planning Committee. The mitigation measures from the 2014 plan were used as base measures for the HMPC to consider for the plan update. To that list, action items that are listed in the 2018 Alabama State Hazard Mitigation Plan mitigation were added. Then mitigation actions the HMPC developed through various exercises that were not covered by either the 2014 plan or the 2018 state plan were added to the list. In addition to those main sources listed above, various mitigation guides and publications published by FEMA in its "How-to" series were consulted for inclusion in the list as were other published mitigation plans.

As noted in 6.5 "Mitigation Measure Identification, Prioritization, Implementation and Administration", the representatives analyzed the possible listed measures by conducting a STAPLEE evaluation and then prioritized the selected measures and assigned responsibility for each measure. The Community Action Plans in this appendix provide the following information:

- The goals, objective and mitigation measures;
- The hazards are addressed by the measure;
- The priority level assigned to the measure;
- The timeline for the measure;
- The lead responsible party for the implementation of the measure;
- Whether the measure is an action or a project;
- The estimated cost to implement the measure; and
- Possible funding source(s) for implementing the measure.

2.0 Community Action Programs for Each Jurisdiction

This section presents the Community Action Programs adopted by each of the participating jurisdictions and school boards. The school board's mitigation measures are included with each jurisdiction's measures. For a listing of the measures and the jurisdictions that chose to implement the measure, see Table 6-7 in Chapter Six.

Notes for the CAPs:

- Action programs are in alphabetical order by jurisdiction.
- The Local Floodplain Manager is an administrator designated through the NFIP as the person responsible for enforcing the local ordinance, and may be the Local Engineer or Local Building Official
- Priorities are *High*, *Medium*, and *Low*.
- Timelines are *Short-Range* (less than 2 years), *Mid-Range* (2-5years), *Long-Range* (more than 5 years) or *On-Going*
- General cost estimates and potential funding sources are identified. FEMA Hazard Mitigation Assistance funds, where noted as a possible funding source, are subject to final eligibility determination, including, among other eligibility criteria, a positive benefit/cost analysis, and the availability of funds.
- Human-caused hazards are intentional acts by people to cause harm such as terrorism, armed assault, and cyberterrorism.
- Technological hazards are accidental disaster events such as chemical spills or hazardous materials releases at a fixed site or during transport.

Abbreviations:

- EMA - Marshall County Emergency Management Agency
- FD – Fire Department
- FEMA – Federal Emergency Management Agency
- FMA - Flood Mitigation Assistance
- HMA – Hazard Mitigation Assistance
- IT – Information Technology Department
- MUB – Municipal Utilities Board
- PD – Police Department
- TBD - To Be Determined

2020 - 2025 Marshall County Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1	**Goal for Prevention. Manage the development of land and buildings to minimize risks of loss due to multiple hazards.**							
1.2	**Planning Studies. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
1.2.3	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	Flooding	Low	Long-Range	EMA	Action	TBD	TBD
1.2.4	Identify existing culturally or socially significant structures within participating jurisdictions that have the most potential for losses from disaster events and identify needed structural upgrades.	All*	Medium	On-Going	District Shop	Action	No Additional Cost	Existing Funds
1.2.5	Inventory and map existing fire hydrants and piping throughout the county and identify areas in need of new fire hydrants and/or areas of insufficient water pressure for fire suppression.	Wildfires	Medium	On-Going	FD	Action	No Additional Cost	Existing Funds
1.2.6	Update Wide Hazardous Flow Study, Fixed Site Tier II Reporting Facilities every 3 years.	Technological	Medium	On-Going	EMA FD	Action	No Additional Cost	Existing Funds
1.2.7	Assist the Alabama Forestry Commission with their Community Wildfire Plan for Marshall County and its jurisdictions.	Wildfire	Low	Long-Range	FD	Action	No Additional Cost	Existing Funds

2020 - 2025 Marshall County Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.3	**<u>Zoning and Subdivision Regulations</u>. Establish effective zoning and subdivision controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							
1.3.1	Require/encourage new subdivisions to implement fire reduction measures such as maintaining minimum intervals between structures, providing firebreaks, on-site water storage, wide roads and multiple accesses are measures to reduce fire risks.	Wildfires	Low	On-Going	Engineer	Action	No Additional Cost	Existing Funds
1.3.4	Evaluate additional land use restrictions within designated flood zones, such as prohibition of storage of buoyant materials, storage of hazardous materials, and restrictive development of flood ways, among others.	Flooding	Low	On-Going	Engineer	Action	No Additional Cost	Existing Funds
1.3.5	Require delineation of floodplain fringe, floodways, and wetlands on all plans submitted with a permit for development within a floodplain.	Flooding	Medium	On-Going	Engineer	Action	No Additional Cost	Existing Funds
1.5	**<u>Floodplain Management Regulations and Management.</u> Effectively administer and enforce local floodplain management regulations.**							
1.5.1	Assist the state in promoting the adoption of a uniform flood hazard prevention ordinance among all NFIP communities.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds

2020 - 2025 Marshall County Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.5.2	Develop guidelines for management of development around flood prone areas and other areas of high flood mitigation values, such as, wetlands, floodplain corridors, upland storage, closed depressional basins and areas of high filtration potential.	Flooding	Medium	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.3	Improve flood risk assessment by monitoring flood events and damages, documenting high water marks post event, verification of FEMA's repetitive loss inventory and revising and updating regulatory floodplain maps.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.4	Train local floodplain managers through programs offered by the State Floodplain Coordinator and FEMA's training center in Emmitsburg, Maryland.	Flooding	Low	On-Going	Floodplain Manager	Action	TBD	Existing Funds
1.5.5	Maintain membership for locally designated floodplain managers in the Association of State Floodplain Managers and the Alabama Association Floodplain Managers and encourage active participation.	Flooding	Low	On-Going	Floodplain Manager	Action	TBD	Existing Funds
1.5.6	Maintain a library of technical assistance and guidance materials to support the local floodplain manager.	Flooding	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
1.5.7	Encourage interagency collaboration in management of beaver populations where beaver activities compromise drainage structures and transportation routes.	Flooding	Medium	On-Going	District Shop	Action	No Additional Cost	Existing Funds

2020 - 2025 Marshall County Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.5.8	Update local floodplain ordinance for compliance with current NFIP standards.	Flooding	Medium	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.9	Continue ongoing relations with the State NFIP Coordinator in relation to floodplain management.	Flooding	Medium	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.6	**<u>Community Rating System Program (CRS).</u> Increase participation of NFIP member communities in the CRS Program.**							
1.6.1	Apply for membership in the CRS Program.	Flooding	Low	Long-Range	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.7	**<u>Storm Water Management.</u> Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**							
1.7.2	Develop, adopt, and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Flooding	Medium	On-Going	Engineer	Action	No Additional Cost	Existing Funds
1.10	**<u>Critical Facilities Assessments.</u> Perform assessments of critical facilities (hospitals, schools, fire and police stations, emergency operation centers, special needs housing, and others) to address building and site vulnerabilities to hazards, identify damage control and retrofit measures to reduce vulnerability to damage and disruption of operations during severe weather and other natural and human-caused disaster events.**							

2020 - 2025 Marshall County Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.10.1	Perform vulnerability assessments of critical facilities, including education facilities, to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards; i.e., protective film inside windows.	All*	Medium	On-Going	Schools	Action	No Additional Cost	Existing Funds
1.10.2	Conduct wildfire vulnerability assessments of critical facilities and other properties in these risk areas and prepare a comprehensive inventory to identify high and moderate wildfire risk areas.	Wildfire	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
1.10.3	Inspect security measures around critical facilities for areas of concern (i.e., cut away areas in security fencing, inoperable cameras) and develop a plan to address the concerns.	Human-Caused	Medium	On-Going	EMA Schools	Action	No Additional Cost	Existing Funds
1.10.4	Perform annual penetration and vulnerability assessments of log files and wire data.	Human-Caused	High	On-Going	IT Schools	Action	TBD	TBD
1.10.5	Encourage water suppliers to assess vulnerability of existing supply systems and share that information with local governments.	Human-Caused	Low	Long-Range	EMA	Action	TBD	TBD
1.10.6	Establish Threat Assessment Teams on each campus.	Human-Caused	High	Short-Range	Schools	Action	No Additional Cost	Existing Funds
1.11	**<u>Geographic Information Systems (GIS) and Information Management</u>. Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories to aid in planning, hazard mitigation and incident reporting.**							

2020 - 2025 Marshall County Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.11.3	Maintain a comprehensive inventory of dams and failure inundation areas within the county and jurisdictions. If applicable, add to GIS mapping.	Dam Failure	High	On-Going	EMA	Action	No Additional Cost	Existing Funds
1.11.4	Provide property assessments of areas impacted by hazards for damage/incident reports. If applicable, add to GIS mapping.	All	Medium	On-Going	EMA	Action	TBD	TBD
1.11.5	Develop a centralized County database of all safe rooms and shelters, both pre-disaster and post-disaster, open to the public for all jurisdictions. Include and update those locations in GIS if applicable.	Tornadoes Hurricanes Severe Storms Earthquakes Technological	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
1.11.6	Keep up-to-date lists of addresses with private safe rooms and shelters to assist fire departments and emergency services agencies. Coordinate the distribution of these lists to the appropriate local government officials.	Tornadoes Hurricanes Severe Storms Earthquakes	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
1.11.7	Maintain a listing of locations of special needs groups, including the elderly and those with Alzheimer's. Disseminate that information to emergency personnel.	All	High	On-Going	EMA	Action	No Additional Cost	Existing Funds

2020 - 2025 Marshall County Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.11.8	Establish a uniform damage reporting procedure for all jurisdictions to utilize in Marshall County with the Marshall County Emergency Management Agency as the clearinghouse for damage assessment data following disaster events.	All	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
1.11.9	Establish a data management system to identify drought-related agricultural losses so subsidy programs can be utilized to their full advantage.	Drought	Low	On-Going	EMA	Action	TBD	TBD
1.13	**<u>Prescribed Burn Regulations and Wildfire Management Programs.</u> Create regulations and programs to reduce storm debris.**							
1.13.1	Support legislation to enact regulations for the timber industry to conduct prescribed burns after clearing land to lessen the possibility of wildfires.	Wildfires	Medium	Long-Range	EMA	Action	No Additional Cost	Existing Funds
1.13.2	Encourage programs to conduct prescribed burns of large undeveloped areas of downed trees from disaster events to lessen the possibility of wildfires.	Wildfires	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds
1.14	**<u>Emergency Operations Plan.</u>**							
1.14.1	Maintain and update emergency operations plans.	All	High	On-Going	EMA Schools	Action	No Additional Cost	Existing Funds
2	**<u>Goal for Human Welfare and Property Protection:</u> Protect people, animals, structures, and contents from the damaging effects of hazards.**							

2020 - 2025 Marshall County Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.6	**<u>Critical Facilities Protection</u>. Protect critical facilities from potential damages and occupants from harm in the event of hazards through retrofits or relocations of existing facilities located in high-risk zones, construction of new facilities, or implementation of security measures for maximum protection from all hazards.**							
2.6.1	Retrofit critical facilities and infrastructure against potential damages from hazards.	All*	Low	Long-Range	EMA	Project	TBD	FEMA HMA Grant
2.6.3	Install lightning and/or surge protection on existing critical facilities.	Lightning	Medium		Schools	Project	TBD	TBD
2.6.4	Require lightning and/or surge protection on new critical facilities.	Lightning	High	Long-Range	EMA	Project	No Additional Cost	Existing Funds
2.6.6	Encourage the planting of species that are less susceptible to damage and ensure that trees are planted far from above ground utility lines and buildings.	Tornadoes Hurricanes Severe StormsWinter Storms	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
2.6.7	Encourage the enhancement of the security of areas surrounding public facilities. Such measures include replacing or removing landscaping that provides cover for attacks, installing motion activated lighting, secure parking lots through fencing and adequate lighting.	Human-Caused	Medium	On-Going	EMA Schools	Action	No Additional Cost	Existing Funds

2020 - 2025 Marshall County Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.6.8	Encourage structural changes to secure the buildings, i.e., replace vulnerable doors, install automatic door locks for after hours, install alarms and panic alarms, install CCTVs throughout facilities	Human-Caused	High	Long-Range	EMA Schools	Action	No Additional Cost	Existing Funds
2.6.9	Install a public address system throughout public buildings for hazard warnings and shelter-in-place announcements.	Dam Failure Tornadoes Hurricanes Severe Storms Human-Caused Technological	High	On-Going	EMA Schools	Project	TBD	TBD
2.6.10	Minimize visitors' access to buildings and provide badges.	Human-Caused	High	On-Going	IT Schools	Action	TBD	TBD
2.6.11	Monitor inflow/outflow of network activity on computer systems in critical facilities to protect against cyberterrorism.	Human-Caused	High	On-Going	IT	Action	No Additional Cost	Existing Funds
2.6.12	Utilize the DHS' free assessment tool for cybersecurity for local governments to find weak areas in cybersecurity and address the issues found.	Human-Caused	High	On-Going	IT	Action	No Additional Cost	Existing Funds

2020 - 2025 Marshall County Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.6.13	Ensure computer firewalls, virus protections, etc. are up-to-date.	Human-Caused	High	On-Going	IT Schools	Action	No Additional Cost	Existing Funds
2.7	**<u>Back Up Power.</u> Assure uninterrupted power supplies during emergency events.**							
2.7.1	Install or encourage the installation of backup power generators for critical facilities, including radio stations, and fuel stations.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	Medium	Mid-Range	Engineer	Project	TBD	BRIC HMGP
2.7.2	Deploy portable generators to serve as miniature sub-stations to help rapidly restore power to at-risk citizens after a hazard event.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	Medium	On-Going	EMA	Project	TBD	TBD

2020 - 2025 Marshall County Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.7.3	Ensure all critical facilities, including facilities serving the elderly and special needs residents test generators on a monthly basis.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	Medium	On-Going	EMA Fire Dept	Action	No Additional Cost	Existing Funds
2.8	**<u>Community Shelters and Safe Rooms</u>: Provide shelter from multiple hazards for the safety of community residents.**							
2.8.1	Work with county and city leaders in developing standardized procedures for identifying shelters as pre-disaster and post-disaster shelters or safe rooms.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	EMA Schools	Action	No Additional Cost	Existing Funds
2.8.2	Review existing public shelters and safe rooms and recommend new locations if and where there are coverage gaps. Include evaluations on ADA compliance and sheltering of animals.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	EMA Schools	Action	No Additional Cost	Existing Funds

2020 - 2025 Marshall County Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.8.3	Work with the American Red Cross (ARC) in developing "Memorandums of Understanding" (MOUs) with facility owners that serve as shelters.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	EMA Schools	Action	No Additional Cost	Existing Funds
2.8.4	Determine how to accommodate individuals with special needs both in the emergency operations plan for the shelter or safe room and in the design of the shelter or safe room, including compliance with the American with Disabilities Act (ADA).	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	EMA Schools	Action	No Additional Cost	Existing Funds
2.8.5	Evaluate the need for severe weather plans and shelters in essential facilities and other establishments serving the public (e.g., schools, hospitals, and critical facilities).	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Medium	On-Going	EMA Schools	Action	No Additional Cost	Existing Funds
2.8.6	Construct new community safe rooms in accessible locations and add safe rooms within new and existing public and institutional buildings, such as schools, colleges and universities, senior centers, community centers, hospitals, and government buildings.	Hurricanes Tornadoes Severe Storms Earthquakes Human-Caused Technological	Medium	Mid-Range	Schools	Project	TBD	FEMA HMA Grant

2020 - 2025 Marshall County Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.8.7	Establish a program for subsidizing individual and community safe room construction in existing facilities.	Hurricanes Tornadoes Severe Storms Earthquakes	Low	Long-Range	EMA Schools	Project	TBD	FEMA HMA Grant
2.8.8	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes Tornadoes Severe Storms Earthquakes	High	On-Going	EMA Schools	Project	No Additional Cost	Existing Funds
2.8.9	Determine which areas at important facilities such as schools and daycare centers are the best locations for occupants during a disaster. Identify and provide directions to the designated “safe place.”	Tornadoes Hurricanes Severe Storms Technological	High	On-Going	EMA Schools	Action	TBD	Existing Funds
2.8.10	Ensure all public buildings have a refuge plan of where to send people during times of disasters. Encourage posting of the plan in places accessible to the public.	Dam Failure Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	Medium	Long-Range	EMA Schools	Action	TBD	Existing Funds

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2.8.11	Establish mutual agreements with other jurisdictions and agencies to help with sheltering of animals during disasters.	Tornadoes Hurricanes Severe Storms	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
2.8.12	Evaluate existing public shelters and safe places for areas for sheltering pets.	Tornadoes Hurricanes Severe Storms	Medium	On-Going	EMA Schools	Action	No Additional Cost	Existing Funds
2.8.13	Evaluate future plans for public shelters and safe places for sheltering pets.	Tornadoes Hurricanes Severe Storms	Medium	On-Going	EMA Schools	Action	No Additional Cost	Existing Funds
2.8.14	Ensure all schools have a place of refuge plan for sporting events held outside and proper posting on where it is located.	Tornadoes Hurricanes Severe Storms Human-Caused Technological	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
2.9	**Human Welfare.**							
2.9.1	Increase collaboration between government and community organizations regarding containment and response plans for epidemic events involving humans.	Pandemic	High	On-Going	EMA	Action	No Additional Cost	Existing Funds

2020 - 2025 Marshall County Community Action Program								
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2.9.2	Continue to support the Area 2 Region Public Health Team in planning and training events such as the Drive-Thru-Flu clinic Exercise, Point of Distribution SNS Exercises and other MMRS activities.	Pandemic	High	On-Going	EMA	Action	TBD	Existing Funds
2.9.3	Identify and secure resources to build the appropriate medical stockpile of medicines and medical supplies to address sizable epidemics through the MMRS-SNS and Area 2 Public Health Plans	Pandemic	High	On-Going	EMA	Action	TBD	TBD
2.9.4	Educate the public about vaccines and immunizations.	Pandemic	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
2.9.5	Require school systems to inform parents/guardians about illness at the schools.	Pandemic	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
2.9.6	Ensure school buses include air conditioning when purchasing replacements buses.	Extreme Heat	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
3	**Goal for Education, Outreach and Awareness. Educate and inform the public, and government and agency staff about the risks of hazards and ways to reduce threats to life and property.**							
3.1	**Community Hazard Mitigation Plan Distribution. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							

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3.1.1	Distribute the 2020 plan to local officials, stakeholders, and interested individuals through internet download.	All	High	Short-Range	EMA	Action	No Additional Cost	Existing Funds
3.3	**Flood Map Information. Increase public access to Flood Insurance Rate Map (FIRM) information.**							
3.3.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications, newspaper announcements and other media related outreach events.	Flooding	Low	Long-Range	Engineer	Action	TBD	FEMA CTP
3.3.2	Inform builders and property owners about complying with the latest NFIP standards.	Flooding	Medium	On-Going	Engineer	Action	No Additional Cost	Existing Funds
3.4	**Hazard Insurance Awareness. Increase public awareness of flood insurance and special riders that may be required for earthquake, landslide, sinkhole, and other damages typically not covered by standard property protection policies.**							
3.4.1	Promote the purchase of insurance coverage by property owners and renters for flood damages and other hazards in high-risk areas.	Flooding Earthquakes Landslides Land Subsidence Human-Caused	Medium	Long-Range	EMA	Action	No Additional Cost	Existing Funds

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3.4.2	Partner with insurance companies to disseminate information on hazards to citizens; i.e., availability of flood insurance in flood prone areas.	Flooding Earthquakes Landslides Land Subsidence Human-Caused	Medium	Long-Range	EMA	Action	No Additional Cost	Existing Funds
3.4.3	Promote the purchase of crop insurance by farmers to cover potential losses due to drought.	Drought	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds
3.5	**<u>Publication Distribution.</u> Use local library resources and other agencies/departments to educate the public on hazard risks and mitigation alternatives through distribution of publications on hazards and hazard mitigation.**							
3.5.1	Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.	All	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds
3.5.2	Distribute FEMA Publication 320 - Taking Shelter from the Storm: Building a Safe Room in Your House - through building permit and inspection offices.	Tornadoes Hurricanes Severe Storms Earthquakes	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.5.4	Implement and distribute “Drought Dos and Don’ts” to the general public.	Drought	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds

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3.5.6	Promote technical information from agencies such as the Insurance Institute for Business and Home Safety and Federal Alliance for Safe Homes.	Tornadoes Hurricanes Severe Storms Earthquakes	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.5.7	Provide emergency preparedness information and resources for the protection and care of animals during extended periods of extreme heat or cold.	Extreme Heat Extreme Cold	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.5.8	Provide awareness materials regarding the appropriate actions to take in the event of a hazardous material release.	Human-Caused	High	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.6	**<u>Outreach Projects.</u> Conduct regular public events to inform the public of hazards and mitigation measures.**							
3.6.1	Continue to participate in environmental awareness events to provide the public information on hazard exposure and mitigation measures, such as City/County Day, Hurricane Awareness Week, and severe Weather Week.	All	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.6.2	Distribute material via the internet and other media, and other outreach activities and workshops to encourage families and individuals to implement hazard mitigation measures in their homes.	All	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.6.3	Promote disaster resilience within the business community through workshops, educational materials, and planning guides.	All	Medium	On-Going	EMA	Action	TBD	Existing Funds

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3.6.4	Promote awareness of human-caused and technological hazards through workshops, educational materials and planning guides to businesses and the general public.	Human-Caused Technological	Medium	On-Going	EMA	Action	TBD	Existing Funds
3.6.6	Develop an educational public awareness campaign informing citizens of land management and landscaping options to limit wildfire spread.	Wildfire	Low	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.6.7	Educate homeowners about the urban – wildland interface and proper plantings and landscaping practices to prevent wildfire destruction.	Wildfire	Low	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.7	**<u>Outreach Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.7.1	Distribute hazard mitigation brochures to students through area schools.	All	Medium	On-Going	Schools		No Additional Cost	Existing Funds
3.7.2	Educate students and the public about the “See Something, Say Something” program, including who to contact about suspicions.	Human-Caused	Medium	On-Going	EMA Schools	Action	No Additional Cost	Existing Funds
3.7.3	Promote the education of citizens on water saving techniques through the local water boards and area schools.	Drought	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds

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3.7.4	Promote the education of farmers on soil and water conservation practices with programs offered by such agencies as the cooperative extension service, USDA.	Drought	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds
3.7.5	Provide emergency preparedness information for extreme temperature events through an active educational outreach program with specific plans and procedures for senior citizens and people with special needs.	Extreme Cold Extreme Heat	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.7.6	Educate homeowners about structural and non-structural retrofitting of homes vulnerable to certain hazards.	Tornadoes Hurricanes Severe Storms Earthquakes Flooding	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds
3.7.7	Educate those in areas without building codes about safer building practices such as the use of fire-resistant materials in construction.	Tornadoes Hurricanes Severe Storms Earthquakes Wildfire	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds

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3.7.8	Educate the citizens about proper procedures for sheltering in place.	Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	High	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.7.9	Educate employees in critical facilities about cybersecurity.	Human-Caused	High	On-Going	IT Schools	Action	No Additional Cost	Existing Funds
3.7.10	Enhance public safety through awareness and outreach materials to the public with regards to pandemics.	Pandemic	High	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.7.11	Educate the public about existing flood warning systems such as Everbridge	Flooding	High	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.7.12	Assist the State EMA with notifying the public about dam inundation areas and explaining the risks associated with dam or levee failure in Marshall County.	Dam or Levee Failure	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds
3.7.13	Educate staff members on proper mitigation measures of pandemic preparedness.	Pandemic	High	On-Going	All Dept Schools	Action	No Additional Cost	Existing Funds

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3.7.14	Educate staff members for the utilization of virtual resources for virtual and/or remote learning or communications during closures due to pandemics or other hazards.	Pandemic Human-Caused Technological	High	Short-Range	All Dept Schools	Action	No Additional Cost	Existing Funds
3.7.15	Upgrade technology devices for students and teachers for utilization during virtual and/or remote learning.	Pandemic Human-Caused Technological	High	Short-Range	Schools	Project	TBD	TBD
3.8	**<u>Training and Webinars.</u> Attend training and educational webinars on mitigation of national human caused and technological hazard.**							
3.8.1	Train additional weather spotters.	Tornadoes Severe Storms Flooding Hurricanes	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.8.2	Train additional ham radio operators for times of emergency.	Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds

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3.8.3	Organize local veterinarians to educate the public and emergency personnel through workshops on the handling of pets, livestock, and wild animals during disasters.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Medium	Long-Range	EMA	Action	No Additional Cost	Existing Funds
3.8.4	Enhance and expand training of fire departments in wildfire hazard areas.	Wildfire	Low	Long-Range	EMA	Action	TBD	TBD
3.8.5	Train operators in snow removal to ensure adequate coverage during severe winter storm events.	Winter Storms	Low	Long-Range	District Shop	Action	TBD	TBD
3.8.6	Promote training and attendance by employees at conferences and webinars sponsored by agencies such as FEMA, DHS, APHD, AEMA and the Marshall County EMA.	All	High	On-Going	EMA Schools	Action	TBD	TBD
3.8.7	Encourage completion of the online course FEMA IS-907 on active shooters by employees in critical facilities.	Human-Caused	Low	Long-Range	EMA Schools	Action	No Additional Cost	Existing Funds
3.8.8	Encourage the participation of groups in programs offered by the Department of Homeland Security; such as courses on Targeted Violence and Terrorism Prevention.	Human-Caused	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds

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3.8.9	Encourage local agricultural businesses to participate in the Strategic Partnership Program for agroterrorism programs.	Human-Caused	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds
3.8.10	Encourage participation by livestock and poultry farmers in programs offered by the USDA such as "Biosecurity for the Birds".	Human-Caused	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.8.11	Expand or participate in expanding traditional disaster exercises involving city and county emergency personnel to include airport and port personnel, infrastructure providers, hospitals, schools, and major employers.	All	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.9	**<u>Disaster Warning and Notification.</u> Improve public warning and notification systems.**							
3.9.1	Review existing outdoor warning siren coverage and recommend new locations if and where there are coverage gaps. Install new warning sirens in accordance with the plan recommendations.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Medium	On-Going	EMA	Project	TBD	FEMA HMA Grant

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3.9.2	Upgrade siren-warning systems.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused	Medium	On-Going	EMA	Project	TBD	FEMA HMA Grant
3.9.4	Enter in agreements with surrounding jurisdictions to upgrade communications to the Project 25 Radio system.	All	High	On-Going	EMA	Action	TBD	FEMA HMA Grant
3.9.5	Create a backup site with communications equipment for 911 services.	All	High	On-Going	911	Project	TBD	FEMA HMA Grant
3.9.6	Develop the capability to re-route communications from one jurisdiction's 911 communication tower to another jurisdiction's in the event of tower failure.	All	High	On-Going	911	Project	TBD	FEMA HMA Grant
3.9.7	Coordinate with utilities and transportation authorities to improve rapid communications between emergency services and the private sector when basic services might be disrupted during extended periods due to disasters.	All	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds

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3.9.8	Establish procedures to warn facilities storing hazardous materials when a hazard event is likely to impact the facility to ensure safety procedures are enacted.	Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.9.9	Evaluate the need for a unified fire advisory system to identify fire risk during extended periods of extreme heat.	Wildfire	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds
3.9.11	Explore options for improving the ability of local units of government to report flooding and flash flooding events, receive information, respond and request assistance.	Flooding	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds
3.9.12	Ensure first responders are aware of any chemicals stored at the school including those used in the science department.	Tornadoes Severe Storms Earthquakes Human-Caused	High	Short-Range	Schools	Action	No Additional Cost	Existing Funds
3.10	**<u>Weather Radios</u>. Improve public access to weather alerts.**							

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3.10.1	Continue to promote the purchase and usage of NOAA weather radios in all schools, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries, and the general public, especially in homes with no outdoor warning siren coverage.	Tornadoes Hurricanes Severe Storms Flooding	High	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.10.3	Distribute weather radios and emergency response instructions to municipal residents and businesses.	Tornadoes Hurricanes Severe Storms Flooding	Medium	On-Going	EMA	Action	TBD	FEMA HMA Grant
3.10.4	Promote the use of weather radios in households and businesses.	Tornadoes Hurricanes Severe Storms Flooding	High	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.11	**<u>Mass Media Relations and Websites</u>. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, on-line social networking, and government/agency websites to increase public awareness and distribute public information on hazard mitigation topics.**							
3.11.1	Maintain appropriate media relationships to ensure the public is informed of hazard threats and means to mitigate property damages and/or loss of life.	All	High	On-Going	EMA	Action	No Additional Cost	Existing Funds

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3.11.2	Increase media coverage of threat and evacuation procedures during peak wildfire times of the year; distribute informational packages in high and moderate wildfire risk areas.	Wildfire	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.11.3	Expand the use of county and city-sponsored websites to disseminate hazard mitigation information.	All	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.11.4	Include hazard information on school websites to disseminate hazard mitigation information with a focus on family safety.	All	Low	On-Going	Schools	Action	No Additional Cost	Existing Funds
4	**Goal for Natural Resources Protection. Preserve and restore the beneficial functions of the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.**							
4.2	**River/Stream Corridor Restoration and Protection. Restore and protect river and stream corridors within areas.**							
4.2.1	Protect wetlands by preventing unsound development that would change their natural condition.	Flooding	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
4.3	**Forestry Programs. Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wildfires inside and outside the urban environment.**							
4.3.3	Develop maintenance programs to clear dead and dry bushes or trees to mitigate wildfires.	Wildfire	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds

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4.3.4	Use controlled burns to decrease the amount of fuel load in the identified moderate and high wildfire hazard areas.	Wildfire	Low	Long-Range	EMA	Project	TBD	FMA
4.3.5	Encourage Volunteer Fire Departments to improve capabilities for responding to and extinguishing wildfires.	Wildfires	High	On-Going	EMA	Action	No Additional Cost	Existing Funds
4.4	**<u>Water Resources Conservation Programs.</u> Protect water quantity and quality through water conservation programs to mitigate the effects of droughts and assure uninterrupted potable water supplies.**							
4.4.1	Encourage water conservation through public outreach programs prior to a drought event.	Drought	Low	On-Going	EMA	Action	No Additional Cost	Existing Funds
4.4.3	Provide advice to jurisdictions on potential new sources of water during extreme drought.	Drought	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
4.4.4	Encourage the implementation of programs by utilities for water metering and leak detection programs.	Drought	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
5	**<u>Goal for Natural System and Infrastructure Improvement and Maintenance Projects.</u> Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where feasible, cost effective, and environmentally suitable.**							
5.1	**<u>Drainage System and Rights-of-Way Maintenance.</u> Improve maintenance programs for streams and drainage ways.**							

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5.1.2	Employ prescribed burns of natural debris along streams and in ditches to enhance storm drainage.	Flooding	Low	Long-Range	FD	Action	No Additional Cost	Existing Funds
5.1.3	Develop and adopt winter maintenance procedures that include smart salting techniques and applying deicing agents before severe winter storms happen.	Winter Storm	Low	Long-Range	District Shop	Action	No Additional Cost	Existing Funds
5.1.4	Collaborate with ALDOT in addressing drainage issues along state roadways.	Flooding	Medium	Long-Range	District Shop	Action	No Additional Cost	Existing Funds
5.2	**<u>Reservoirs and Drainage System Improvements.</u> Control flooding through reservoirs and other structural improvements, where deemed cost effective and feasible, such as levees/floodwalls, diversions, channel modifications, dredging, drainage modifications, and storm sewers.**							
5.2.1	Construct drainage improvements to reduce or eliminate localized flooding, including retention and detention ponds.	Flooding	Medium	On-Going	Engineer	Project	TBD	FEMA HMA Grant

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1	**Goal for Prevention. Manage the development of land and buildings to minimize risks of loss due to multiple hazards.**							
1.1	**Comprehensive Plans and Smart Growth. Establish an active comprehensive planning program that is consistent with Smart Growth principles of sustainable community development.**							
1.1.1	Maintain up-to-date comprehensive plan.	All	High	On-Going	Building/ Planning Dept	Action	TBD	TBD
1.1.2	Integrate the findings and recommendations of this hazard mitigation plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	High	On-Going	Building/ Planning Dept	Action	TBD	TBD
1.1.3	Prepare a five-year capital improvements plan (CIP) to include capital projects that implement the natural, human-caused, and technological hazard element of the community's comprehensive plan or projects identified in the Community Mitigation Action Program of this multi-hazard mitigation plan.	All	low	Long-Range	Administration	Action	TBD	TBD
1.2	**Planning Studies. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
1.2.1	Carry out detailed planning and engineering studies for sub-basins in critical flood hazard areas to determine watershed-wide solutions to flooding.	Flooding	Medium	On-Going	City Civil Engineer	Action	TBD	TBD

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1.2.2	Evaluate elevation and culvert sizing of existing roadways in flash flood prone areas to ensure compliance with current standards for design year floods and develop a program for construction upgrades as appropriate.	Flooding	Medium	On-Going	City Civil Engineer	Action	No Additional Cost	Existing Funds
1.2.3	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	Flooding	Medium	On-Going	Building/ Planning Dept	Action	TBD	TBD
1.2.4	Identify existing culturally or socially significant structures within participating jurisdictions that have the most potential for losses from disaster events and identify needed structural upgrades.	All*	Medium	On-Going	Public Works	Action	No Additional Cost	Existing Funds
1.2.7	Assist the Alabama Forestry Commission with their Community Wildfire Plan for Marshall County and Albertville.	Wildfire	Low	Long-Range	FD	Action	No Additional Cost	Existing Funds

2020 - 2025 Albertville Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.3	**<u>Zoning and Subdivision Regulations</u>. Establish effective zoning and subdivision controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							
1.3.2	Update zoning regulations to include maximum impervious surface standards for non-residential developments.	Flooding	Medium	On-Going	Building/ Planning Dept	Action	No Additional Cost	Existing Funds
1.4	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from multi-hazard damages.**							
1.4.1	Promote good construction practices and proper code enforcement to mitigate structural failures during disaster events.	Tornadoes Hurricanes Severe Storms Earthquakes Human Caused	High	On-Going	Building/ Planning Dept	Action	No Additional Cost	Existing Funds
1.4.2	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	Tornadoes Hurricanes Severe Storms Earthquakes	Medium	On-Going	Building/ Planning Dept	Action	No Additional Cost	Existing Funds
1.4.3	Evaluate and revise as appropriate, building codes for roof construction to maximize protection against wind damage from hurricanes, tornadoes, and severe storms; encourage installation of “hurricane clips.”	Tornadoes Hurricanes Severe Storms	High	On-Going	Building/ Planning Dept	Action	No Additional Cost	Existing Funds

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1.4.4	Through local subdivision and land development regulations require the placement of all new utility lines underground for large residential subdivisions and commercial developments.	Tornadoes Severe Storms Winter Storms Hurricanes	High	On-Going	Building/ Planning Dept	Action	TBD	TBD
1.4.5	Review fire safety ordinances to ensure they properly regulate open burning.	Wildfires	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
1.5	**<u>Floodplain Management Regulations and Management.</u> Effectively administer and enforce local floodplain management regulations.**							
1.5.1	Assist the state in promoting the adoption of a uniform flood hazard prevention ordinance among all NFIP communities.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.2	Develop guidelines for management of development around flood prone areas and other areas of high flood mitigation values, such as, wetlands, floodplain corridors, upland storage, closed depressional basins and areas of high filtration potential.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.3	Improve flood risk assessment by monitoring flood events and damages, documenting high water marks post event, verification of FEMA's repetitive loss inventory and revising and updating regulatory floodplain maps.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds

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1.5.4	Train local floodplain managers through programs offered by the State Floodplain Coordinator and FEMA's training center in Emmitsburg, Maryland.	Flooding	Low	On-Going	Floodplain Manager	Action	TBD	Existing Funds
1.5.5	Maintain membership for locally designated floodplain managers in the Association of State Floodplain Managers and the Alabama Association Floodplain Managers and encourage active participation.	Flooding	Medium	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.6	Maintain a library of technical assistance and guidance materials to support the local floodplain manager.	Flooding	Medium	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.8	Update local floodplain ordinance for compliance with current NFIP standards.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.9	Continue ongoing relations with the State NFIP Coordinator in relation to floodplain management.	Flooding	Medium	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.6	**<u>Community Rating System Program (CRS).</u> Increase participation of NFIP member communities in the CRS Program.**							
1.6.1	Apply for membership in the CRS Program; continue to upgrade rating.	Flooding	Medium	Short-Range	Floodplain Manager	Action	No Additional Cost	Existing Funds

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1.7	**<u>Storm Water Management.</u> Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**							
1.7.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	Flooding	High	On-Going	Building/ Planning Dept	Action	No Additional Cost	Existing Funds
1.7.2	Develop, adopt, and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Flooding	High	On-Going	Building/ Planning Dept	Action	No Additional Cost	Existing Funds
1.8	**<u>Open Space Preservation</u>. Minimize disturbances of natural land features and increased storm water runoff through regulations that maintain critical natural features such as open space for drainage, parks, conservation areas, and landscaping.**							
1.8.1	Examine regulatory options and feasibility of requiring open space areas for drainage control, recreation, and landscaping.	Flooding	Medium	On-Going	Public Works	Action	No Additional Cost	Existing Funds
1.10	**<u>Critical Facilities Assessments.</u> Perform assessments of critical facilities (hospitals, schools, fire and police stations, emergency operation centers, special needs housing, and others) to address building and site vulnerabilities to hazards, identify damage control and retrofit measures to reduce vulnerability to damage and disruption of operations during severe weather and other natural and human-caused disaster events.**							
1.10.1	Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards.	All *	Medium	On-Going	Building/ Planning Dept	Action	TBD	TBD

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1.10.5	Encourage water suppliers to assess vulnerability of existing supply systems and share that information with local governments.	Human-Caused	Medium	On-Going	Mayor & Council MUB (municipal utilities board)	Action	TBD	TBD
1.11	**<u>Geographic Information Systems (GIS) and Information Management</u>. Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories to aid in planning, hazard mitigation and incident reporting.**							
1.11.1	Maintain a hazards and risk assessment database that is accessible to local planners and emergency management personnel, including such data as, flood zones, geohazards, tornado tracks, disaster events and their extents, major drainage structures and a comprehensive inventory of critical facilities, including points of distribution within all jurisdictions. If applicable, add to GIS mapping.	All	High	Long-Range	Mayor & Council in partnership with Marshall County EMA	Action	No Additional Cost	Existing Funds
1.11.7	Maintain a listing of locations of special needs groups, including the elderly and those with Alzheimer's. Disseminate that information to emergency personnel.	All	High	On-Going	Fire Dept/ Public Safety	Action	No Additional Cost	Existing Funds

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1.11.8	Establish a uniform damage reporting procedure for Albertville with the Marshall County Emergency Management Agency as the clearinghouse for damage assessment data following disaster events.	All	Medium	On-Going	Public Works	Action	No Additional Cost	Existing Funds
1.14	**Emergency Operations Plan.**							
1.14.1	Maintain and update emergency operations plans.	All	High	On-Going	Public Safety	Action	No Additional Cost	Existing Funds
2	**Goal for Human Welfare and Property Protection: Protect people, animals, structures and contents from the damaging effects of hazards.**							
2.1	**Building Relocation. Relocate buildings out of hazardous flood areas to safeguard against damages and establish permanent open space.**							
2.1.1	Relocate buildings out of hazardous flood areas, with emphasis on pre-FIRM residential buildings, where deemed more cost effective than property acquisition or building elevation.	Flooding	Medium	On-Going	Floodplain Manager	Project	TBD	FEMA HMA Grant
2.2	**Building Acquisition. Acquire flood prone buildings and properties and establish permanent open space.**							
2.2.1	Utilize the most recent NFIP repetitive loss property list, and other appropriate sources, to create and maintain a prioritized list of acquisition mitigation projects based on claims paid.	Flooding	Medium	On-Going	Floodplain Manager	Action	TBD	FEMA HMA Grant

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2.2.2	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	Flooding	Medium	On-Going	Floodplain Manager	Project	TBD	FEMA HMA Grant
2.2.3	Acquire and relocate or demolish structures located in Landslide Hazard Areas and enforce permanent restrictions after land acquisition and structure removal.	Landslide	low	On-Going	Building/ Planning Dept	Project	TBD	FEMA HMA Grant
2.3	**<u>Building Elevation.</u> Elevate buildings in hazardous flood areas to safeguard against damages.**							
2.3.1	Elevate certain buildings in flood prone areas where acquisition or relocation is not feasible, with emphasis on Pre-FIRM buildings.	Flooding	Medium	On-Going	Floodplain Manager	Project	TBD	FEMA HMA Grant
2.5	**<u>Flood Proofing.</u> Encourage flood proofing of buildings in hazardous flood areas to safeguard against damages.**							
2.5.1	Flood proof pre-FIRM non-residential buildings, where feasible.	Flooding	Medium	On-Going	Floodplain Manager	Project	TBD	FEMA HMA Grant
2.5.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	Flooding	Medium	On-Going	Floodplain Manager	Project	TBD	FEMA HMA Grant

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2.6	**<u>Critical Facilities Protection</u>. Protect critical facilities from potential damages and occupants from harm in the event of hazards through retrofits or relocations of existing facilities located in high-risk zones, construction of new facilities, or implementation of security measures for maximum protection from all hazards.**							
2.6.1	Retrofit critical facilities and infrastructure against potential damages from hazards.	All*	Medium	On-Going	Mayor & Council	Project	TBD	FEMA HMA Grant
2.6.2	Encourage the relocation of existing utility lines underground, where feasible and cost effective.	Tornadoes Severe Storms Winter Storms Hurricanes	High	ongoing	Mayor & Council	Action	No Additional Cost	Existing Funds
2.6.3	Install lightning and/or surge protection on existing critical facilities.	Lightning	High	On-Going	Mayor & Council	Project	TBD	TBD
2.6.4	Require lightning and/or surge protection on new critical facilities.	Lightning	High	On-Going	MUB	Project	No Additional Cost	Existing Funds
2.6.5	Conduct tree trimming programs along utility lines.	Tornadoes Hurricanes Severe Storms Winter Storms	Medium	On-Going	MUB	Project	TBD	TBD

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2.6.6	Encourage the planting of species that are less susceptible to damage and ensure that trees are planted far from above ground utility lines and buildings.	Tornadoes Hurricanes Severe Storms Winter Storms	low	On-Going	Administration & "Keep Albertville Beautiful" Board	Action	No Additional Cost	Existing Funds
2.6.7	Encourage the enhancement of the security of areas surrounding public facilities. Such measures include replacing or removing landscaping that provides cover for attacks, installing motion activated lighting, secure parking lots through fencing and adequate lighting.	Human-Caused	Medium	On-Going	Mayor & Council	Action	No Additional Cost	Existing Funds
2.6.8	Encourage structural changes to secure the buildings, i.e., replace vulnerable doors, install automatic door locks for after hours, install alarms and panic alarms, install CCTVs throughout facilities	Human-Caused	Medium	On-Going	Mayor & Council	Action	No Additional Cost	Existing Funds
2.6.9	Install a public address system throughout public buildings for hazard warnings and shelter-in-place announcements.	Dam Failure Tornadoes Hurricanes Severe Storms Human-Caused Technological	Medium	On-Going	Mayor & Council	Project	TBD	TBD

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2.6.10	Minimize visitors' access to buildings and provide badges.	Human-Caused	low	On-Going	Mayor & Council	Action	TBD	TBD
2.6.11	Monitor inflow/outflow of network activity on computer systems in critical facilities to protect against cyberterrorism.	Human-Caused	High	Short-Range	IT	Action	No Additional Cost	Existing Funds
2.6.12	Utilize the DHS' free assessment tool for cybersecurity for local governments to find weak areas in cybersecurity and address the issues found.	Human-Caused	High	Short-Range	IT	Action	No Additional Cost	Existing Funds
2.7	**Emergency Power Generation. Assure uninterrupted power supplies during emergency events.**							
2.7.1	Install or encourage the installation of backup power generators for critical facilities, including radio stations, and fuel stations.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	Medium	Mid-Range	Mayor & Council/ Administration	Project	TBD	BRIC HMGP
2.8	**Community Shelters and Safe Rooms: Provide shelter from multiple hazards for the safety of community residents.**							

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2.8.1	Work with city and county leaders in developing standardized procedures for identifying shelters as pre-disaster and post-disaster shelters or safe rooms.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	Mayor & Council/ Administration	Action	No Additional Cost	Existing Funds
2.8.2	Review existing public shelters and safe rooms and recommend new locations if and where there are coverage gaps. Include evaluations on ADA compliance and sheltering of animals.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	Mid-Range	Administration/ Building/ Planning Dept	Action	No Additional Cost	Existing Funds
2.8.3	Work with the American Red Cross (ARC) in developing "Memorandums of Understanding" (MOUs) with facility owners that serve as shelters.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
2.8.4	Determine how to accommodate individuals with special needs both in the emergency operations plan for the shelter or safe room and in the design of the shelter or safe room, including compliance with the American with Disabilities Act (ADA).	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	Building Dept Planning Dept Fire Dept	Action	No Additional Cost	Existing Funds

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2.8.6	Construct new community safe rooms in accessible locations and add safe rooms within new and existing public and institutional buildings, such as schools, colleges and universities, senior centers, community centers, hospitals, and government buildings.	Hurricanes Tornadoes Severe Storms Earthquakes Human-Caused Technological	Medium	Long-Range	Building Dept	Project	TBD	FEMA HMA Grant
2.8.8	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes Tornadoes Severe Storms Earthquakes	Medium	On-Going	Building Dept	Project	No Additional Cost	Existing Funds
2.8.9	Determine which areas at important facilities such as schools and daycare centers are the best locations for occupants during a disaster. Identify and provide directions to the designated “safe place.”	Tornadoes Hurricanes Severe Storms Technological	Medium	On-Going	Public Safety	Action	TBD	Existing Funds
2.8.11	Establish mutual agreements with other jurisdictions and agencies to help with sheltering of animals during disasters.	Tornadoes Hurricanes Severe Storms	Medium	On-Going	Albertville Police Animal Control	Action	No Additional Cost	Existing Funds
2.8.12	Evaluate existing public shelters and safe places for areas for sheltering pets.	Tornadoes Hurricanes Severe Storms	Medium	On-Going	Albertville Police Animal Control	Action	No Additional Cost	Existing Funds

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2.8.13	Evaluate future plans for public shelters and safe places for sheltering pets.	Tornadoes Hurricanes Severe Storms Human-Caused Technological	Low	On-Going	Albertville Police Animal Control	Action	No Additional Cost	Existing Funds
3	**Goal for Education, Outreach and Awareness. Educate and inform the public, and government and agency staff about the risks of hazards and ways to reduce threats to life and property.**							
3.1	**Community Hazard Mitigation Plan Distribution. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.1.1	Distribute the 2020 plan to local officials, stakeholders, and interested individuals through internet download.	All	High	On-Going	Public Safety	Action	No Additional Cost	Existing Funds
3.3	**Flood Map Information. Increase public access to Flood Insurance Rate Map (FIRM) information.**							
3.3.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications, newspaper announcements and other media related outreach events.	Flooding	High	On-Going	Building Dept	Action	TBD	FEMA CTP
3.3.2	Inform builders and property owners about complying with the latest NFIP standards.	Flooding	High	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
3.5	**Publication Distribution. Use local library resources and other agencies/departments to educate the public on hazard risks and mitigation alternatives through distribution of publications on hazards and hazard mitigation.**							

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3.5.1	Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.	All	Medium	On-Going	Albertville Public Library	Action	No Additional Cost	Existing Funds
3.5.2	Distribute FEMA Publication 320 - Taking Shelter from the Storm: Building a Safe Room in Your House - through building permit and inspection offices.	Tornadoes Hurricanes Severe Storms Earthquakes	Medium	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
3.5.3	Distribute awareness materials to citizens, builders and business owners inquiring about flood problems or other flood related questions.	Flooding	Medium	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
3.5.7	Provide emergency preparedness information about the protection and care of animals during extended periods of extreme heat or cold.	Extreme Heat Extreme Cold	Medium	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
3.5.8	Provide awareness materials regarding the appropriate actions to take in the event of a hazardous material release.	Human-Caused	Medium	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
3.6	**<u>Outreach Projects.</u> Conduct regular public events to inform the public of hazards and mitigation measures.**							

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3.6.2	Distribute material via the internet and other Media, and other outreach activities and workshops to encourage families and individuals to implement hazard mitigation measures in their homes.	All	High	On-Going	Communications / Public Safety	Action	No Additional Cost	Existing Funds
3.7	**<u>Outreach Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.7.8	Educate the citizens about proper procedures for sheltering in place.	Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	High	On-Going	Communications / Public Safety	Action	No Additional Cost	Existing Funds
3.7.9	Educate employees in critical facilities about cybersecurity.	Human-Caused	Medium	On-Going	IT	Action	No Additional Cost	Existing Funds
3.7.10	Enhance public safety through awareness and outreach materials to the public with regards to pandemics.	Pandemic	Medium	On-Going	Communications	Action	No Additional Cost	Existing Funds
3.7.11	Educate the public about existing flood warning systems such as Everbridge	Flooding	High	On-Going	Communications / Public Safety	Action	No Additional Cost	Existing Funds
3.8	**<u>Training and Webinars.</u> Attend training and educational webinars on mitigation of national human caused and technological hazard.**							

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3.8.6	Promote training and attendance by employees at conferences and webinars sponsored by agencies such as FEMA, DHS, APHD, AEMA and the Marshall County EMA.	All	High	On-Going	Mayor & Council/ Administration	Action	TBD	TBD
3.8.11	Expand or participate in expanding traditional disaster exercises involving city and county emergency personnel to include airport and port personnel, infrastructure providers, hospitals, schools, and major employers.	All	High	On-Going	Administration/ Public Safety	Action	No Additional Cost	Existing Funds
3.9	**Disaster Warning and Notification. Improve public warning and notification systems.**							
3.9.3	Upgrade critical communications infrastructure.	All	High	On-Going	Administration/ Public Safety	Project	TBD	FEMA HMA Grant
3.9.4	Enter in agreements with surrounding jurisdictions to upgrade communications to the Project 25 Radio system.	All	Low	Mid-Range	Administration/ Public Safety	Action	TBD	FEMA HMA Grant
3.9.5	Create a backup site with communications equipment for 911 services.	All	High	On-Going	Public Safety	Project	TBD	FEMA HMA Grant
3.9.6	Develop the capability to re-route communications from one jurisdiction's 911 communication tower to another jurisdiction's in the event of tower failure.	All	High	On-Going	Public Safety	Project	TBD	FEMA HMA Grant

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3.9.7	Coordinate with utilities and transportation authorities to improve rapid communications between emergency services and the private sector when basic services might be disrupted during extended periods due to disasters.	All	High	On-Going	Public Safety	Action	No Additional Cost	Existing Funds
3.9.8	Establish procedures to warn facilities storing hazardous materials when a hazard event is likely to impact the facility to ensure safety procedures are enacted.	Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Medium	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
3.9.11	Explore options for improving the ability of local units of government to report flooding and flash flooding events, receive information, respond and request assistance.	Flooding	Medium	On-Going	Public Works	Action	No Additional Cost	Existing Funds
3.10	**<u>Weather Radios</u>. Improve public access to weather alerts.**							
3.10.1	Continue to promote the purchase and usage of NOAA weather radios in all schools, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries, and the general public, especially in homes with no outdoor warning siren coverage.	Tornadoes Hurricanes Severe Storms Flooding	High	On-Going	Public Safety/ Communications	Action	No Additional Cost	Existing Funds

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3.10.3	Distribute weather radios and emergency response instructions to municipal residents and businesses.	Tornadoes Hurricanes Severe Storms Flooding	High	On-Going	Public Safety	Action	TBD	FEMA HMA Grant
3.10.4	Promote the use of weather radios in households and businesses.	Tornadoes Hurricanes Severe Storms Flooding	High	On-Going	Communications	Action	No Additional Cost	Existing Funds
3.11	**<u>Mass Media Relations and Websites</u>. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, on-line social networking, and government/agency websites to increase public awareness and distribute public information on hazard mitigation topics.**							
3.11.1	Maintain appropriate media relationships to ensure the public is informed of hazard threats and means to mitigate property damages and/or loss of life.	All	High	On-Going	Communications	Action	No Additional Cost	Existing Funds
3.11.3	Expand the use of city-sponsored websites to disseminate hazard mitigation information.	All	High	On-Going	Communications / Public Safety	Action	No Additional Cost	Existing Funds
4	**<u>Goal for Natural Resources Protection</u>. Preserve and restore the beneficial functions of the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.**							
4.2	**<u>River/Stream Corridor Restoration and Protection.</u> Restore and protect river and stream corridors within areas.**							

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4.2.1	Protect wetlands by preventing unsound development that would change their natural condition.	Flooding	High	On-Going	City Civil Engineer	Action	No Additional Cost	Existing Funds
4.2.2	Keep builders and developers informed of Federal wetlands permitting requirements of the Corps of Engineers.	Flooding	High	On-Going	City Civil Engineer	Action	No Additional Cost	Existing Funds
4.2.3	Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.	Flooding	med	On-Going	City Civil Engineer	Action	No Additional Cost	Existing Funds
5	**Goal for Natural System and Infrastructure Improvement and Maintenance Projects. Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where feasible, cost effective, and environmentally suitable.**							
5.1	**Drainage System and Rights-of-Way Maintenance. Improve maintenance programs for streams and drainage ways.**							
5.1.1	Prepare and implement standard operating procedures and guidelines for drainage system maintenance. Ensure storm drains and ditches are not blocked and are able to receive water.	Flooding	High	On-Going	Public Works	Action	No Additional Cost	Existing Funds
5.1.4	Collaborate with ALDOT in addressing drainage issues along state roadways.	Flooding	High	On-Going	Public Works/ Administration/ Public Safety	Action	No Additional Cost	Existing Funds
5.2	**Reservoirs and Drainage System Improvements. Control flooding through reservoirs and other structural improvements, where deemed cost effective and feasible, such as levees/floodwalls, diversions, channel modifications, dredging, drainage modifications, and storm sewers.**							

2020 - 2025 Albertville Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
5.2.1	Construct drainage improvements to reduce or eliminate localized flooding.	Flooding	High	On-Going	Public Works	Project	TBD	FEMA HMA Grant

2020-2025 Arab Community Action Program								
	Goal, Objectives and Mitigation Measures	Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1	**Goal for Prevention. Manage the development of land and buildings to minimize risks of loss due to multiple hazards.**							
1.1	**Comprehensive Plans and Smart Growth. Establish an active comprehensive planning program that is consistent with Smart Growth principles of sustainable community development.**							
1.1.1	Maintain up-to-date comprehensive plan.	All	High	Mid-Range	City Admin	Action	TBD	TBD
1.1.2	Integrate the findings and recommendations of this hazard mitigation plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	High	Mid-Range	City Admin	Action	TBD	TBD
1.1.3	Prepare a five-year capital improvements plan (CIP) to include capital projects that implement the natural, human-caused, and technological hazard element of the community's comprehensive plan or projects identified in the Community Mitigation Action Program of this multi-hazard mitigation plan.	All	High	Mid-Range	City Admin	Action	TBD	TBD
1.2	**Planning Studies. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
1.2.1	Carry out detailed planning and engineering studies for sub-basins in critical flood hazard areas to determine watershed-wide solutions to flooding.	Flooding	Medium	Mid-Range	City Admin	Action	TBD	TBD

2020-2025 Arab Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.2.2	Evaluate elevation and culvert sizing of existing roadways in flash flood prone areas to ensure compliance with current standards for design year floods and develop a program for construction upgrades as appropriate.	Flooding	Medium	Mid-Range	Street Dept	Action	No Additional Cost	Existing Funds
1.2.7	Assist the Alabama Forestry Commission with their Community Wildfire Plan for Arab.	Wildfire	Low	Long-Range	Fire Dept	Action	No Additional Cost	Existing Funds
1.3	**<u>Zoning and Subdivision Regulations</u>. Establish effective zoning and subdivision controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							
1.3.2	Update zoning regulations to include maximum impervious surface standards for non-residential developments.	Flooding	Medium	Mid-Range	Planning Dept	Action	No Additional Cost	Existing Funds
1.3.3	Update zoning regulations to protect hazardous slopes, thereby preventing landslides and preserving vegetation to filter runoff for water quality protection.	Landslides	High		Planning Dept	Action	No Additional Cost	Existing Funds
1.4	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from multi-hazard damages.**							
1.4.1	Promote good construction practices and proper code enforcement to mitigate structural failures during disaster events.	Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused	High	Mid-Range	Building Dept	Action	No Additional Cost	Existing Funds

2020-2025 Arab Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.4.2	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	Tornadoes Hurricanes Severe Storms Earthquakes	High	Mid-Range	Building Dept	Action	No Additional Cost	Existing Funds
1.4.3	Evaluate and revise as appropriate, building codes for roof construction to maximize protection against wind damage from hurricanes, tornadoes, and severe storms; encourage installation of "hurricane clips."	Tornadoes Hurricanes Severe Storms	High	Mid-Range	Building Dept	Action	No Additional Cost	Existing Funds
1.4.4	Through local subdivision and land development regulations require the placement of all new utility lines underground for large residential subdivisions and commercial developments.	Tornadoes Severe Storms Winter Storms Hurricanes	Medium	Mid-Range	Building Dept	Action	TBD	TBD
1.4.5	Review fire safety ordinances to ensure they properly regulate open burning.	Wildfires	Medium	Mid-Range	Fire Dept	Action	No Additional Cost	Existing Funds
1.5	**<u>Floodplain Management Regulations and Management.</u> Effectively administer and enforce local floodplain management regulations.**							
1.5.1	Assist the state in promoting the adoption of a uniform flood hazard prevention ordinance among all NFIP communities.	Flooding	Medium	Mid-Range	Floodplain Manager	Action	No Additional Cost	Existing Funds

2020-2025 Arab Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.5.3	Improve flood risk assessment by monitoring flood events and damages, documenting high water marks post event, verification of FEMA's repetitive loss inventory and revising and updating regulatory floodplain maps.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.4	Train local floodplain managers through programs offered by the State Floodplain Coordinator and FEMA's training center in Emmitsburg, Maryland.	Flooding	Low	On-Going	Floodplain Manager	Action	TBD	Existing Funds
1.5.5	Maintain membership for locally designated floodplain managers in the Association of State Floodplain Managers and the Alabama Association Floodplain Managers and encourage active participation.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.8	Update local floodplain ordinance for compliance with current NFIP standards.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.9	Continue ongoing relations with the State NFIP Coordinator in relation to floodplain management.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds

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1.6	**<u>Community Rating System Program (CRS).</u> Increase participation of NFIP member communities in the CRS Program.**							
1.6.1	Apply for membership in the CRS Program.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.7	**<u>Storm Water Management.</u> Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**							
1.7.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	Flooding	High	Mid-Range	Street Dept	Action	No Additional Cost	Existing Funds
1.7.2	Develop, adopt, and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Flooding	High	Mid-Range	Planning Dept	Action	No Additional Cost	Existing Funds
1.8	**<u>Open Space Preservation</u>. Minimize disturbances of natural land features and increased storm water runoff through regulations that maintain critical natural features such as open space for drainage, parks, conservation areas, and landscaping.**							
1.8.1	Examine regulatory options and feasibility of requiring open space areas for drainage control, recreation, and landscaping.	Flooding	High	Mid-Range	Planning Dept	Action	No Additional Cost	Existing Funds

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	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.9	**Landscape Ordinances. Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff, damage from wind events, mitigate wildfires and improve urban aesthetics.**							
1.9.1	Review and revise as necessary, landscaping standards for parking lots that reduce the size of impervious surfaces and encourage natural infiltration of rainwater.	Flooding	High	Mid-Range	Planning Dept	Action	No Additional Cost	Existing Funds
1.10	**Critical Facilities Assessments. Perform assessments of critical facilities (hospitals, schools, fire and police stations, emergency operation centers, special needs housing, and others) to address building and site vulnerabilities to hazards, identify damage control and retrofit measures to reduce vulnerability to damage and disruption of operations during severe weather and other natural and human-caused disaster events.**							
1.10.1	Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards; i.e., protective film inside windows.	All *	High	On-Going	City Admin, Schools	Action	TBD	TBD
1.10.3	Inspect security measures around critical facilities for areas of concern (i.e., cut away areas in security fencing, inoperable cameras) and develop a plan to address the concerns.	Human-Caused	High	On-Going	Building Dept, Schools	Action	No Additional Cost	Existing Funds
1.10.4	Perform annual penetration and vulnerability assessments of log files and wire data.	Human-Caused	High	On-Going	IT Dept, Schools	Action	TBD	TBD

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1.10.6	Establish Threat Assessment Teams on each campus.	Human-Caused	High	Short-Range	Schools	Action	No Additional Cost	Existing Funds
1.11	**<u>Geographic Information Systems (GIS) and Information Management</u>. Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories to aid in planning, hazard mitigation and incident reporting.**							
1.11.1	Maintain a hazards and risk assessment database that is accessible to local planners and emergency management personnel, including such data as, flood zones, geohazards, tornado tracks, disaster events and their extents, major drainage structures and a comprehensive inventory of critical facilities, including points of distribution within all jurisdictions. If applicable, add to GIS mapping.	All	Medium	On-Going	City Admin	Action	No Additional Cost	Existing Funds
1.11.7	Maintain a listing of locations of special needs groups, including the elderly and those with Alzheimer's. Disseminate that information to emergency personnel.	All	Medium	Mid-Range	Fire Dept	Action	No Additional Cost	Existing Funds
1.11.8	Establish a uniform damage reporting procedure for Arab to utilize with the Marshall County Emergency Management Agency as the clearinghouse for damage assessment data following disaster events.	All	High	Mid-Range	Fire Dept	Action	No Additional Cost	Existing Funds

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1.12	**Dam Safety Management. Establish a comprehensive dam safety program.**							
1.12.1	Support legislation to establish a State dam safety program.	Dam Failure	Medium	Mid-Range	City Admin	Action	No Additional Cost	Existing Funds
1.14	**Emergency Operations Plan.**							
1.14.1	Maintain and update emergency operations plans.	All	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
2	**Goal for Human Welfare and Property Protection: Protect people, animals, structures, and contents from the damaging effects of hazards.**							
2.6	**Critical Facilities Protection. Protect critical facilities from potential damages and occupants from harm in the event of hazards through retrofits or relocations of existing facilities located in high-risk zones, construction of new facilities, or implementation of security measures for maximum protection from all hazards.**							
2.6.5	Conduct tree trimming programs along utility lines.	Tornadoes Hurricanes Severe Storms Winter Storms	Medium	On-Going	Street Dept	Project	TBD	TBD
2.6.7	Encourage the enhancement of the security of areas surrounding public facilities. Such measures include replacing or removing landscaping that provides cover for attacks, installing motion activated lighting, secure parking lots through fencing and adequate lighting.	Human-Caused	Medium	On-Going	City Admin, Schools	Action	No Additional Cost	Existing Funds

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2.6.8	Encourage structural changes to secure the buildings, i.e., replace vulnerable doors, install automatic door locks for after hours, install alarms and panic alarms, install CCTVs throughout facilities	Human-Caused	High	On-Going	City Admin, Schools	Project	TBD	TBD
2.6.9	Install a public address system throughout public buildings for hazard warnings and shelter-in-place announcements.	Dam Failure Tornadoes Hurricanes Severe Storms Human-Caused Technological	High	On-Going	Schools	Project	TBD	TBD
2.6.10	Minimize visitors' access to buildings and provide badges.	Human-Caused	Low	On-Going	Schools	Action	TBD	TBD
2.6.11	Monitor inflow/outflow of network activity on computer systems in critical facilities to protect against cyberterrorism.	Human-Caused	Medium	On-Going	IT Dept, Schools	Action	No Additional Cost	Existing Funds
2.6.12	Utilize the DHS' free assessment tool for cybersecurity for local governments to find weak areas in cybersecurity and address the issues found.	Human-Caused	Medium	On-Going	IT Dept	Action	No Additional Cost	Existing Funds
2.6.13	Ensure computer firewalls, virus protections, etc. are up-to-date.	Human-Caused	High	On-Going	IT Dept, Schools	Action	No Additional Cost	Existing Funds

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2.7	**<u>Back Up Power.</u> Assure uninterrupted power supplies during emergency events.**							
2.7.1	Install or encourage the installation of backup power generators for critical facilities, including radio stations, and fuel stations.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused	High	Mid-Range	City Admin	Project	TBD	HMGP
2.8	**<u>Community Shelters and Safe Rooms</u>: Provide shelter from multiple hazards for the safety of community residents.**							
2.8.2	Review existing public shelters and safe rooms in public buildings including schools and recommend new locations if and where there are coverage gaps. Include evaluations on ADA compliance and sheltering of animals.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	Mid-Range	Building Dept, Schools	Action	No Additional Cost	Existing Funds
2.8.4	Determine how to accommodate individuals with special needs both in the emergency operations plan for the shelter or safe room and in the design of the shelter or safe room, including compliance with the American with Disabilities Act (ADA).	Hurricanes Tornadoes Severe Storms Earthquakes	High	Mid-Range	Building Dept, Schools	Action	No Additional Cost	Existing Funds

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2.8.5	Evaluate the need for severe weather plans and shelters in essential facilities and other establishments serving the public (e.g., schools, hospitals, and critical facilities).	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	Mid-Range	Fire Dept, Schools	Action	No Additional Cost	Existing Funds
2.8.6	Construct new community safe rooms in accessible locations and add safe rooms within new and existing public and institutional buildings, such as schools, colleges and universities, senior centers, community centers, hospitals, and government buildings.	Hurricanes Tornadoes Severe Storms Earthquakes Human-Caused Technological	Medium	On-Going	City Admin, Schools	Project	TBD	FEMA HMA Grant
2.8.7	Establish a program for subsidizing individual and community safe room construction in existing facilities.	Hurricanes Tornadoes Severe Storms Earthquakes	Low	On-Going	Building Dept	Project	TBD	FEMA HMA Grant
2.8.8	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes Tornadoes Severe Storms Earthquakes	Low	On-Going	Building Dept	Project	No Additional Cost	Existing Funds

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2.8.9	Determine which areas at important facilities such as schools and daycare centers are the best locations for occupants during a disaster. Identify and provide directions to the designated "safe place."	Tornadoes Hurricanes Severe Storms Technological	High	Mid-Range	Fire Dept, Schools	Action	TBD	Existing Funds
2.8.10	Ensure all public buildings have a refuge plan of where to send people during times of disasters. Encourage posting of the plan in places accessible to the public.	Dam Failure Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	High	On-Going	Fire Dept, Schools	Action	TBD	Existing Funds
2.8.11	Establish mutual agreements with other jurisdictions and agencies to help with sheltering of animals during disasters.	Tornadoes Hurricanes Severe Storms	Low	On-Going	Police Dept	Action	No Additional Cost	Existing Funds
2.8.12	Evaluate existing public shelters and safe places for areas for sheltering pets.	Tornadoes Hurricanes Severe Storms	Low	On-Going	Police Dept	Action	No Additional Cost	Existing Funds
2.8.13	Evaluate future plans for public shelters and safe places for sheltering pets.	Tornadoes Hurricanes Severe Storms	Low	On-Going	Police Dept	Action	No Additional Cost	Existing Funds

2020-2025 Arab Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.8.14	Ensure all schools have a place of refuge plan for activities held outside and proper posting on where it is located.	Tornadoes Hurricanes Severe Storms Human-Caused Technological	High	Short-Range	Police Dept, Schools	Action	No Additional Cost	Existing Funds
2.9	**Human Welfare.**							
2.9.1	Increase collaboration between government and community organizations regarding containment and response plans for epidemic events involving humans.	Pandemic	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
2.9.2	Continue to support the Area 2 Region Public Health Team in planning and training events such as the Drive-Thru-Flu clinic Exercise, Point of Distribution SNS Exercises and other MMRS activities.	Pandemic	High	On-Going	Fire Dept	Action	TBD	Existing Funds
2.9.3	Identify and secure resources to build the appropriate medical stockpile of medicines and medical supplies to address sizable epidemics through the MMRS-SNS and Area 2 Public Health Plans	Pandemic	High	On-Going	Fire Dept	Action	TBD	TBD
2.9.4	Educate the public about vaccines and immunizations.	Pandemic	High	Short Range	Health Dept, Schools	Action	No Additional Cost	Existing Funds

2020-2025 Arab Community Action Program								
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2.9.5	Require school systems to inform parents/guardians about illness at the schools	Pandemic	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
2.9.6	Ensure school buses include air conditioning when purchasing replacements buses.	Extreme Heat	High	Long-Range	Schools	Action	No Additional Cost	Existing Funds
3	**Goal for Education, Outreach and Awareness. Educate and inform the public, and government and agency staff about the risks of hazards and ways to reduce threats to life and property.**							
3.1	**Community Hazard Mitigation Plan Distribution. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.1.1	Distribute the 2020 plan to local officials, stakeholders, and interested individuals through internet download.	All	Medium	On-Going	City Admin	Action	No Additional Cost	Existing Funds
3.2	**Technical Assistance. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**							
3.2.1	Provide technical assistance to owners of vulnerable buildings to advise on available building retrofits to protect against hazards damages.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes	Medium	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
3.3	**Flood Map Information. Increase public access to Flood Insurance Rate Map (FIRM) information.**							

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3.3.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications, newspaper announcements and other media related outreach events.	Flooding	Medium	On-Going	Building Dept	Action	TBD	FEMA CTP
3.3.2	Inform builders and property owners about complying with the latest NFIP standards.	Flooding	Medium	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
3.5	**<u>Publication Distribution.</u> Use local library resources and other agencies/departments to educate the public on hazard risks and mitigation alternatives through distribution of publications on hazards and hazard mitigation.**							
3.5.1	Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.	All	Medium	On-Going	Library	Action	No Additional Cost	Existing Funds
3.5.2	Distribute FEMA Publication 320 - Taking Shelter from the Storm: Building a Safe Room in Your House - through building permit and inspection offices.	Tornadoes Hurricanes Severe Storms Earthquakes	Medium	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
3.5.3	Distribute outreach materials to citizens, builders and business owners inquiring about flood problems or other flood related questions.	Flooding	Medium	On-Going	Building Dept	Action	No Additional Cost	Existing Funds

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3.5.6	Promote technical information from agencies such as the Insurance Institute for Business and Home Safety and Federal Alliance for Safe Homes.	Tornadoes Hurricanes Severe Storms Earthquakes	Medium	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
3.5.7	Provide emergency preparedness information and resources for the protection and care of animals during extended periods of extreme heat or cold.	Extreme Heat Extreme Cold	Medium	On-Going	Animal Control	Action	No Additional Cost	Existing Funds
3.5.8	Provide outreach materials regarding the appropriate actions to take in the event of a hazardous material release.	Human-Caused	Medium	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
3.7	**<u>Outreach Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.7.1	Distribute hazard mitigation brochures to students through area schools.	All	Low	Mid-Range	Schools	Action	No Additional Cost	Existing Funds
3.7.2	Educate students and the public about the “See Something, Say Something” program, including who to contact about suspicions.	Human-Caused	Medium	On-Going	Police Dept, Schools	Action	No Additional Cost	Existing Funds

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3.7.5	Provide emergency preparedness for extreme temperature events through an active educational outreach program with specific plans and procedures for senior citizens and people with special needs.	Extreme Cold Extreme Heat	Medium	On-Going	City Admin	Action	No Additional Cost	Existing Funds
3.7.8	Educate the citizens about proper procedures for sheltering in place.	Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	Medium	On-Going	City Admin	Action	No Additional Cost	Existing Funds
3.7.9	Educate employees in critical facilities about cybersecurity.	Human-Caused	Medium	On-Going	City Admin, Schools	Action	No Additional Cost	Existing Funds
3.7.10	Enhance public safety through awareness and outreach materials to the public with regards to pandemics.	Pandemic	Medium	On-Going	City Admin	Action	No Additional Cost	Existing Funds
3.7.13	Educate staff members on proper mitigation measures of pandemic preparedness	Pandemic	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
3.7.14	Educate staff members for the utilization of virtual resources for virtual and/or remote learning or communications during closures due to pandemics or other hazards.	Pandemic Human-Caused Technological	High	Short-Range	Schools	Action	No Additional Cost	Existing Funds

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3.7.15	Upgrade technology devices for students and teachers for utilization during virtual and/or remote learning.	Pandemic	High	Short-Range	Schools	Project	TBD	TBD
3.8	**<u>Training and Webinars.</u> Attend training and educational webinars on mitigation of national human caused and technological hazard.**							
3.8.3	Organize local veterinarians to educate the public and emergency personnel through workshops on the handling of pets, livestock, and wild animals during disasters .	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Low	On-Going	Animal Control	Action	No Additional Cost	Existing Funds
3.8.6	Promote training and attendance by employees at conferences and webinars sponsored by agencies such as FEMA, DHS, APHD, AEMA and the Marshall County EMA.	All	Medium	On-Going	City Admin, Schools	Action	TBD	TBD
3.8.7	Encourage completion of the online course FEMA IS-907 on active shooters by employees in critical facilities.	Human-Caused	High	On-Going	City Admin, Schools	Action	No Additional Cost	Existing Funds

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3.9	**<u>Disaster Warning and Notification.</u> Improve public warning and notification systems.**							
3.9.1	Review existing outdoor warning siren coverage and recommend new locations if and where there are coverage gaps. Install new warning sirens in accordance with the plan recommendations.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	High	On-Going	Fire Dept	Project	TBD	FEMA HMA Grant
3.9.2	Upgrade siren-warning systems.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused	High	On-Going	Fire Dept	Project	TBD	FEMA HMA Grant
3.9.3	Upgrade critical communications infrastructure.	All	High	On-Going	Police Dept, Fire Dept	Project	TBD	FEMA HMA Grant
3.9.4	Enter in agreements with surrounding jurisdictions to upgrade communications to the Project 25 Radio system.	All	High	On-Going	City Admin	Action	TBD	FEMA HMA Grant

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Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.9.5	Create a backup site with communications equipment for 911 services.	All	High	On-Going	City Admin	Project	TBD	FEMA HMA Grant
3.9.6	Develop the capability to re-route communications from one jurisdiction's 911 communication tower to another jurisdiction's in the event of tower failure.	All	High	On-Going	Police Dept, Fire Dept	Project	TBD	FEMA HMA Grant
3.9.7	Coordinate with utilities and transportation authorities to improve rapid communications between emergency services and the private sector when basic services might be disrupted during extended periods due to disasters.	All	High	On-Going	Police Dept, Fire Dept	Action	No Additional Cost	Existing Funds
3.9.8	Establish procedures to warn facilities storing hazardous materials when a hazard event is likely to impact the facility to ensure safety procedures are enacted.	Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
3.9.12	Ensure first responders are aware of any chemicals stored at the school including those used in the science department.	Tornadoes Severe Storms Earthquakes Human-Caused	High	On-Going	Schools	Action	No Additional Cost	Existing Funds

2020-2025 Arab Community Action Program								
	Goal, Objectives and Mitigation Measures	Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.10	**Weather Radios. Improve public access to weather alerts.**							
3.10.1	Continue to promote the purchase and usage of NOAA weather radios in all schools, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries, and the general public, especially in homes with no outdoor warning siren coverage.	Tornadoes Hurricanes Severe Storms Flooding	High	Mid-Range	Fire Dept, Schools	Action	No Additional Cost	Existing Funds
3.10.2	Require/encourage the installation of weather radios in all public buildings and places of public assembly.	Tornadoes Hurricanes Severe Storms Flooding	Medium	On-Going	City Admin, Fire Dept	Action	No Additional Cost	Existing Funds
3.10.3	Distribute weather radios and emergency response instructions to municipal residents and businesses.	Tornadoes Hurricanes Severe Storms Flooding	Medium	On-Going	Fire Dept	Action	TBD	FEMA HMA Grant
3.10.4	Promote the use of weather radios in households and businesses.	Tornadoes Hurricanes Severe Storms Flooding	Medium	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds

2020-2025 Arab Community Action Program								
	Goal, Objectives and Mitigation Measures	Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.11	**Mass Media Relations and Websites. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, on-line social networking, and government/agency websites to increase public awareness and distribute public information on hazard mitigation topics.**							
3.11.1	Maintain appropriate media relationships to ensure the public is informed of hazard threats and means to mitigate property damages and/or loss of life.	All	Medium	On-Going	Police Dept, Fire Dept	Action	No Additional Cost	Existing Funds
3.11.3	Expand the use of city-sponsored websites to disseminate hazard mitigation information.	All	Medium	On-Going	City Admin	Action	No Additional Cost	Existing Funds
4	**Goal for Natural Resources Protection. Preserve and restore the beneficial functions of the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.**							
4.3	**Forestry Programs. Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wildfires inside and outside the urban environment.**							
4.3.1	Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).	Flooding	Medium	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
4.3.4	Use controlled burns to decrease the amount of fuel load in the identified moderate and high wildfire hazard areas.	Wildfire	Medium	On-Going	Fire Dept	Project	TBD	FMA

2020-2025 Arab Community Action Program								
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5	**Goal for Natural System and Infrastructure Improvement and Maintenance Projects. Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where feasible, cost effective, and environmentally suitable.**							
5.1	**Drainage System and Rights-of-Way Maintenance. Improve maintenance programs for streams and drainage ways.**							
5.1.1	Prepare and implement standard operating procedures and guidelines for drainage system maintenance. Ensure storm drains and ditches are not blocked and are able to receive water.	Flooding	Medium	Mid-Range	Street Dept	Action	No Additional Cost	Existing Funds
5.2	**Reservoirs and Drainage System Improvements. Control flooding through reservoirs and other structural improvements, where deemed cost effective and feasible, such as levees/floodwalls, diversions, channel modifications, dredging, drainage modifications, and storm sewers.**							
5.2.1	Construct drainage improvements to reduce or eliminate localized flooding.	Flooding	High	Mid-Range	Street Dept	Project	TBD	FEMA HMA Grant

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Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1	**Goal for Prevention. Manage the development of land and buildings to minimize risks of loss due to multiple hazards.**							
1.1	**Comprehensive Plans and Smart Growth. Establish an active comprehensive planning program that is consistent with Smart Growth principles of sustainable community development.**							
1.1.1	Maintain up-to-date comprehensive plan.	All	High	On-Going	Planning Comm, City Admin	Action	TBD	TBD
1.1.2	Integrate the findings and recommendations of this hazard mitigation plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	High	On - Going	City Admin	Action	TBD	TBD
1.2	**Planning Studies. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
1.2.1	Carry out detailed planning and engineering studies for sub-basins in critical flood hazard areas to determine watershed-wide solutions to flooding.	Flooding	High	Long-Range	Flood Plain Managers	Action	TBD	TBD
1.2.2	Evaluate elevation and culvert sizing of existing roadways in flash flood prone areas to ensure compliance with current standards for design year floods and develop a program for construction upgrades as appropriate.	Flooding	High	Long-Range	Flood Plain Managers	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.2.3	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	Flooding	High	Long-Range	Street Dept	Action	TBD	TBD
1.2.4	Identify existing culturally or socially significant structures within participating jurisdictions that have the most potential for losses from disaster events and identify needed structural upgrades.	All*	Low	Long-Range	Planning Comm	Action	No Additional Cost	Existing Funds
1.2.5	Inventory and map existing fire hydrants and piping throughout the city and identify areas in need of new fire hydrants and/or areas of insufficient water pressure for fire suppression.	Wildfires	High	Short-Range	Fire Dept, Water Dept, Northeast Water Authority	Action	No Additional Cost	Existing Funds
1.2.7	Assist the Alabama Forestry Commission with their Community Wildfire Plan for Marshall County and its jurisdictions.	Wildfire	Low	Long-Range	FD	Action	No Additional Cost	Existing Funds
1.3	**<u>Zoning and Subdivision Regulations</u>. Establish effective zoning and subdivision controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.3.1	Require/encourage new subdivisions to implement fire reduction measures such as maintaining minimum intervals between structures, providing firebreaks, on-site water storage, wide roads and multiple accesses are measures to reduce fire risks.	Wildfires	High	On-Going	Fire Dept, Building Inspector, Planning Comm	Action	No Additional Cost	Existing Funds
1.3.2	Update zoning regulations to include maximum impervious surface standards for non-residential developments.	Flooding	High	On Going	Planning Comm, Building Inspector	Action	No Additional Cost	Existing Funds
1.3.4	Evaluate additional land use restrictions within designated flood zones, such as prohibition of storage of buoyant materials, storage of hazardous materials, and restrictive development of flood ways, among others.	Flooding	High	On-Going	Building Inspector/ Ordinance Enforcement	Action	No Additional Cost	Existing Funds
1.3.5	Require delineation of floodplain fringe, floodways, and wetlands on all plans submitted with a permit for development within a floodplain.	Flooding	High	On-Going	Building Inspector/ Ordinance Enforcement	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.3.6	Enact local ordinances that require community storm shelters within sizeable mobile home parks, apartment complexes, RV parks and other planned communities.	Tornadoes Hurricanes Severe Storms	High	On-Going	Building Inspector	Action	No Additional Cost	Existing Funds
1.4	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from multi-hazard damages.**							
1.4.1	Promote good construction practices and proper code enforcement to mitigate structural failures during disaster events.	Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused	High	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
1.4.2	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	Tornadoes Hurricanes Severe Storms Earthquakes	High	On-Going	Building Dept / Ordinance Enforcement	Action	No Additional Cost	Existing Funds
1.4.3	Evaluate and revise as appropriate, building codes for roof construction to maximize protection against wind damage from hurricanes, tornadoes, and severe storms; encourage installation of “hurricane clips.”	Tornadoes Hurricanes Severe Storms	High	On-Going	Building Dept	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.4.4	Through local subdivision and land development regulations require the placement of all new utility lines underground for large residential subdivisions and commercial developments.	Tornadoes Severe Storms Winter Storms Hurricanes	Medium	Long	Planning Comm, Building Dept	Action	TBD	TBD
1.4.5	Review fire safety ordinances to ensure they properly regulate open burning.	Wildfires	High	Short-Range	Boaz Fire	Action	No Additional Cost	Existing Funds
1.4.6	Require the construction of safe rooms within new public buildings, such as new schools, libraries, community centers, and other public buildings by amending applicable ordinances and regulations.	Tornadoes Hurricanes Severe Storms Human-Caused Technological	Low	Mid-Range	Boaz Fire, Building City, City Gov	Action	No Additional Cost	Existing Funds
1.4.7	Encourage state lawmakers along with the homebuilder's association, home builder's licensure board, and the Alabama General Contractors Board to pass a regulation requiring the establishment of building safety departments at the county to level to enforce safer building practices in unincorporated areas, to assist in eliminating blight and substandard, unsafe housing.	Tornadoes Hurricanes Severe Storms Earthquakes Flooding	Low	Long-Range	City Officials	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.5	**<u>Floodplain Management Regulations and Management.</u> Effectively administer and enforce local floodplain management regulations.**							
1.5.1	Assist the state in promoting the adoption of a uniform flood hazard prevention ordinance among all NFIP communities.	Flooding	High	On-Going	Building Dept/ Flood Plain Managers	Action	No Additional Cost	Existing Funds
1.5.2	Develop guidelines for management of development around flood prone areas and other areas of high flood mitigation values, such as, wetlands, floodplain corridors, upland storage, closed depressional basins and areas of high filtration potential.	Flooding	Low	Long	Flood Plain Managers	Action	No Additional Cost	Existing Funds
1.5.3	Improve flood risk assessment by monitoring flood events and damages, documenting high water marks post event, verification of FEMA's repetitive loss inventory and revising and updating regulatory floodplain maps.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.4	Train local floodplain managers through programs offered by the State Floodplain Coordinator and FEMA's training center in Emmitsburg, Maryland.	Flooding	Medium	Mid-Range	Flood Plain Managers	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
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1.5.5	Maintain membership for locally designated floodplain managers in the Association of State Floodplain Managers and the Alabama Association Floodplain Managers and encourage active participation.	Flooding	High	Long - Range	Flood Plain Managers	Action	No Additional Cost	Existing Funds
1.5.6	Maintain a library of technical assistance and guidance materials to support the local floodplain manager.	Flooding	High	On-Going	Flood Plain Managers	Action	No Additional Cost	Existing Funds
1.5.7	Encourage interagency collaboration in management of beaver populations where beaver activities compromise drainage structures and transportation routes.	Flooding	Low	On-Going	Street Dept	Action	No Additional Cost	Existing Funds
1.5.8	Update local floodplain ordinance for compliance with current NFIP standards.	Flooding	Medium	On-Going	Flood Plain Managers	Action	No Additional Cost	Existing Funds
1.5.9	Continue ongoing relations with the State NFIP Coordinator in relation to floodplain management.	Flooding	Low	On-Going	Flood Plain Managers	Action	No Additional Cost	Existing Funds
1.6	**<u>Community Rating System Program (CRS).</u> Increase participation of NFIP member communities in the CRS Program.**							
1.6.1	Apply for membership in the CRS Program; continue to upgrade rating.	Flooding	High	On-Going	Building Dept	Action	No Additional Cost	Existing Funds

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1.7	**Storm Water Management. Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**							
1.7.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	Flooding	High	On-Going	Building Dept, Planning Comm	Action	No Additional Cost	Existing Funds
1.7.2	Develop, adopt, and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Flooding	High	On-Going	Building Dept, Planning Comm	Action	No Additional Cost	Existing Funds
1.8	**Open Space Preservation. Minimize disturbances of natural land features and increased storm water runoff through regulations that maintain critical natural features such as open space for drainage, parks, conservation areas, and landscaping.**							
1.8.1	Examine regulatory options and feasibility of requiring open space areas for drainage control, recreation, and landscaping.	Flooding	High	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
1.9	**Landscape Ordinances. Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff, damage from wind events, mitigate wildfires and improve urban aesthetics.**							
1.9.1	Review and revise as necessary, landscaping standards for parking lots that reduce the size of impervious surfaces and encourage natural infiltration of rainwater.	Flooding	High	On-Going	Building Dept	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.10	**Critical Facilities Assessments. Perform assessments of critical facilities (hospitals, schools, fire and police stations, emergency operation centers, special needs housing, and others) to address building and site vulnerabilities to hazards, identify damage control and retrofit measures to reduce vulnerability to damage and disruption of operations during severe weather and other natural and human-caused disaster events.**							
1.10.1	Perform vulnerability assessments of critical facilities, including education facilities, to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards; i.e., protective film inside windows.	All*	Medium	On-Going	Schools	Action	No Additional Cost	Existing Funds
1.10.3	Inspect security measures around critical facilities for areas of concern (i.e., cut away areas in security fencing, inoperable cameras) and develop a plan to address the concerns.	Human-Caused	High	On-Going	Boaz PD, Schools	Action	No Additional Cost	Existing Funds
1.10.4	Perform annual penetration and vulnerability assessments of log files and wire data.	Human-Caused	High	On-Going	Personnel Director Economic Director	Action	TBD	TBD
1.10.5	Encourage water suppliers to assess vulnerability of existing supply systems and share that information with local governments.	Human-Caused	High	On-Going	Boaz Water, Northeast Water Authority Boaz City Council	Action	TBD	TBD

2020 - 2025 Boaz Community Action Program								
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1.10.6	Establish Threat Assessment Teams on each campus.	Human-Caused	High	Short-Range	Schools	Action	No Additional Cost	Existing Funds
1.11	**<u>Geographic Information Systems (GIS) and Information Management</u>. Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories to aid in planning, hazard mitigation and incident reporting.**							
1.11.1	Maintain a hazards and risk assessment database that is accessible to local planners and emergency management personnel, including such data as, flood zones (FIRM), geohazards, tornado tracks, disaster events and their extents, major drainage structures and a comprehensive inventory of critical facilities, including points of distribution within all jurisdictions. If applicable, add to GIS mapping.	All	Low	On-Going	Public Safety	Action	No Additional Cost	Existing Funds
1.11.2	Mark depths of flooding and storm surge immediately after each event and record the data with GIS mapping if available.	Flooding	Medium	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
1.11.4	Provide property assessments of areas impacted by hazards for damage/incident reports. If applicable, add to GIS mapping.	All	Medium	Short-Range	Building, Fire and Street Dept	Action	TBD	TBD

2020 - 2025 Boaz Community Action Program								
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1.11.5	Develop a centralized database of all safe rooms and shelters, both pre-disaster and post-disaster, open to the public for all jurisdictions. Include and update those locations in GIS if applicable.	Tornadoes Hurricanes Severe Storms Earthquakes Technological	High		EMA / STATE	Action	No Additional Cost	Existing Funds
1.11.6	Keep up-to-date lists of addresses with private safe rooms and shelters to assist fire departments and emergency services agencies. Coordinate the distribution of these lists to the appropriate local government officials.	Tornadoes Hurricanes Severe Storms Earthquakes	High	Short-Range	Boaz FD	Action	No Additional Cost	Existing Funds
1.11.7	Maintain a listing of locations of special needs groups, including the elderly and those with Alzheimer's. Disseminate that information to emergency personnel.	All	Medium	Short-Range	Boaz FD	Action	No Additional Cost	Existing Funds
1.11.8	Establish a uniform damage reporting procedure for Boaz to utilize with the Marshall County Emergency Management Agency as the clearinghouse for damage assessment data following disaster events.	All	High	Mid-Range	Building Dept, Police, Street Dept, Fire Dept	Action	No Additional Cost	Existing Funds

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1.11.9	Establish a data management system to identify drought-related agricultural losses so subsidy programs can be utilized to their full advantage.	Drought	High	On-Going	Local Governments and Associate Associations	Action	TBD	TBD
1.13	**<u>Prescribed Burn Regulations and Wildfire Management Programs.</u> Create regulations and programs to reduce storm debris.**							
1.13.1	Support legislation to enact regulations for the timber industry to conduct prescribed burns after clearing land to lessen the possibility of wildfires.	Wildfires	Low	Long-Range	City Government	Action	No Additional Cost	Existing Funds
1.13.2	Encourage programs to conduct prescribed burns of large undeveloped areas of downed trees from disaster events to lessen the possibility of wildfires.	Wildfires	Low	Long-Range	Fire Dept	Action	No Additional Cost	Existing Funds
1.14	**<u>Emergency Operations Plan.</u>**							
1.14.1	Maintain and update emergency operations plans.	All	Medium	On-Going	Fire Dept, Building Dept, Street Dept, Police, Schools	Action	No Additional Cost	Existing Funds
2	**<u>Goal for Human Welfare and Property Protection:</u> Protect people, animals, structures and contents from the damaging effects of hazards.**							
2.4	**<u>Building Retrofits.</u> Retrofit vulnerable buildings and their surroundings to protect against multiple hazard damages, including flooding, high winds, tornadoes, hurricanes, severe storms, earthquakes, and human-caused hazards.**							

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2.4.1	Retrofit existing buildings against potential damages from natural and human-caused hazards.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused	High	Short-Range	Dept Heads, City Council, City Admin	Action	TBD	FEMA HMA Grant
2.6	**<u>Critical Facilities Protection</u>. Protect critical facilities from potential damages and occupants from harm in the event of hazards through retrofits or relocations of existing facilities located in high-risk zones, construction of new facilities, or implementation of security measures for maximum protection from all hazards.**							
2.6.2	Encourage the relocation of existing utility lines underground, where feasible and cost effective.	Tornadoes Severe Storms Winter Storms Hurricanes	High	Long-Range	City Government	Action	No Additional Cost	Existing Funds
2.6.5	Conduct tree trimming programs along utility lines.	Tornadoes Hurricanes Severe Storms Winter Storms	High	On-Going	Marshall Dekalb Electrical Coop, Alabama Power and Cherokee Electric coop	Project	TBD	TBD
2.6.6	Encourage the planting of species that are less susceptible to damage and ensure that trees are planted far from above ground utility lines and buildings.	Tornadoes Hurricanes Severe Storms Winter Storms	High	On-Going	Zoning, Building Dept	Action	No Additional Cost	Existing Funds

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2.6.7	Encourage the enhancement of the security of areas surrounding public facilities. Such measures include replacing or removing landscaping that provides cover for attacks, installing motion activated lighting, secure parking lots through fencing and adequate lighting.	Human-Caused	High	On-Going	All Depts Schools	Action	No Additional Cost	Existing Funds
2.6.8	Encourage structural changes to secure the buildings, i.e., replace vulnerable doors, install automatic door locks for after hours, install alarms and panic alarms, install CCTVs throughout facilities	Human-Caused	High	On-Going	All Depts Schools	Action	No Additional Cost	Existing Funds
2.6.9	Install a public address system throughout public buildings for hazard warnings and shelter-in-place announcements.	Dam Failure Tornadoes Hurricanes Severe Storms Human-Caused Technological	Low	Long-Range	IT Dept Schools	Project	TBD	TBD
2.6.10	Minimize visitors' access to buildings and provide badges.	Human-Caused	High	On-Going	All Depts Schools	Action	TBD	TBD

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2.6.11	Monitor inflow/outflow of network activity on computer systems in critical facilities to protect against cyberterrorism.	Human-Caused	High	On-Going	Farmers Telecom	Action	No Additional Cost	Existing Funds
2.6.12	Utilize the DHS' free assessment tool for cybersecurity for local governments to find weak areas in cybersecurity and address the issues found.	Human-Caused	High	Short-Range	Farmers Telecom	Action	No Additional Cost	Existing Funds
2.7	**<u>Back Up Power.</u> Assure uninterrupted power supplies during emergency events.**							
2.7.1	Install or encourage the installation of backup power generators for critical facilities, including radio stations, and fuel stations.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused	High	Mid-Range	Planning Commission	Project	TBD	HMGP BRIC
2.7.2	Deploy portable generators to serve as miniature sub-stations to help rapidly restore power to at-risk citizens after a hazard event.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	High	Long-Range	Local Electrical Utilities	Project	TBD	TBD

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2.8	**<u>Community Shelters and Safe Rooms</u>: Provide shelter from multiple hazards for the safety of community residents.**							
2.8.1	Work with city and county leaders in developing standardized procedures for identifying shelters as pre-disaster and post-disaster shelters or safe rooms.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	Mid-Range	EMA, Fire Dept, Planning Comm	Action	No Additional Cost	Existing Funds
2.8.2	Review existing public shelters and safe rooms and recommend new locations if and where there are coverage gaps. Include evaluations on ADA compliance and sheltering of animals.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	Short-Range	City Govt, Schools	Action	No Additional Cost	Existing Funds
2.8.3	Work with the American Red Cross (ARC) in developing "Memorandums of Understanding" (MOUs) with facility owners that serve as shelters.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Low	Long-Range	Fire Dept, Police	Action	No Additional Cost	Existing Funds
2.8.4	Determine how to accommodate individuals with special needs both in the emergency operations plan for the shelter or safe room and in the design of the shelter or safe room, including compliance with the American with Disabilities Act (ADA).	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	Long-Range	Fire Dept, Police	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.8.5	Evaluate the need for severe weather plans and shelters in essential facilities and other establishments serving the public (e.g., schools, hospitals, and critical facilities).	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	Long-Range	EMA, Fire Dept, Planning Comm, City Govt, Schools	Action	No Additional Cost	Existing Funds
2.8.6	Construct new community safe rooms in accessible locations and add safe rooms within new and existing public and institutional buildings, such as schools, colleges and universities, senior centers, community centers, hospitals, and government buildings.	Hurricanes Tornadoes Severe Storms Earthquakes Human-Caused Technological	High	Long-Range	City Govt, Building Dept, Fire Dept, Police, Schools	Project	TBD	FEMA HMA Grant
2.8.8	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes Tornadoes Severe Storms Earthquakes	Medium	On-Going	Building Dept	Project	No Additional Cost	Existing Funds
2.8.9	Determine which areas at important facilities such as schools and daycare centers are the best locations for occupants during a disaster. Identify and provide directions to the designated “safe place.”	Tornadoes Hurricanes Severe Storms Technological	High	Mid-Range	Mayor & City Council, Schools	Action	TBD	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.8.10	Ensure all public buildings have a refuge plan of where to send people during times of disasters. Encourage posting of the plan in places accessible to the public.	Dam Failure Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	High	Short-Range	All Dept's, Schools	Action	TBD	Existing Funds
2.8.11	Establish mutual agreements with other jurisdictions and agencies to help with sheltering of animals during disasters.	Tornadoes Hurricanes Severe Storms	Low	Long-Range	Rec Center Director	Action	No Additional Cost	Existing Funds
2.8.12	Evaluate existing public shelters and safe places for areas for sheltering pets.	Tornadoes Hurricanes Severe Storms	Low	Long-Range	Rec Center Director	Action	No Additional Cost	Existing Funds
2.8.13	Evaluate future plans for public shelters and safe places for sheltering pets.	Tornadoes Hurricanes Severe Storms	Low	Long-Range	Rec Center Director	Action	No Additional Cost	Existing Funds
2.8.14	Ensure all schools have a place of refuge plan for sporting events held outside and proper posting on where it is located.	Tornadoes Hurricanes Severe Storms Human-Caused Technological	High	On-Going	Schools	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.9	**Human Welfare.**							
2.9.1	Increase collaboration between government and community organizations regarding containment and response plans for epidemic events involving humans.	Pandemic	High	On-Going	Mayor & City Council	Action	No Additional Cost	Existing Funds
2.9.2	Continue to support the Area 2 Region Public Health Team in planning and training events such as the Drive-Thru-Flu clinic Exercise, Point of Distribution SNS Exercises and other MMRS activities.	Pandemic	High	On-Going	Marshall Medical Board, Fire Dept, Alabama Dept Of Public Health	Action	TBD	Existing Funds
2.9.3	Identify and secure resources to build the appropriate medical stockpile of medicines and medical supplies to address sizable epidemics through the MMRS-SNS and Area 2 Public Health Plans	Pandemic	High	On-Going	Marshall Medical Board, Fire Dept, Alabama Dept Of Public Health	Action	TBD	TBD
2.9.4	Educate the public about vaccines and immunizations.	Pandemic	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
2.9.5	Require school systems to inform parents/guardians about illness at the schools	Pandemic	High	On-Going	Schools	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.9.6	Ensure school buses include air conditioning when purchasing replacements buses.	Extreme Heat	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
3	**Goal for Education, Outreach and Awareness. Educate and inform the public, and government and agency staff about the risks of hazards and ways to reduce threats to life and property.**							
3.1	**Community Hazard Mitigation Plan Distribution. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.1.1	Distribute the 2020 plan to local officials, stakeholders, and interested individuals through internet download.	All	High	Short-Range	City Admin	Action	No Additional Cost	Existing Funds
3.2	**Technical Assistance. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**							
3.2.1	Provide technical assistance to owners of vulnerable buildings to advise on available building retrofits to protect against hazards damages.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes	Low	Long-Range	Building Dept	Action	No Additional Cost	Existing Funds
3.3	**Flood Map Information. Increase public access to Flood Insurance Rate Map (FIRM) information.**							

2020 - 2025 Boaz Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.3.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications, newspaper announcements and other media related outreach events.	Flooding	Medium	Mid-Range	Building Dept	Action	TBD	FEMA CTP
3.3.2	Inform builders and property owners about complying with the latest NFIP standards.	Flooding	Medium	Mid-Range	Building Dept	Action	No Additional Cost	Existing Funds
3.4	**<u>Hazard Insurance Awareness.</u> Increase public awareness of flood insurance and special riders that may be required for earthquake, landslide, sinkhole, and other damages typically not covered by standard property protection policies.**							
3.4.2	Partner with insurance companies to disseminate information on hazards to citizens; i.e., availability of flood insurance in flood prone areas.	Flooding Earthquakes Landslides Land Subsidence Human-Caused	Low	Mid-Range	City Admin	Action	No Additional Cost	Existing Funds
3.5	**<u>Publication Distribution.</u> Use local library resources and other agencies/departments to educate the public on hazard risks and mitigation alternatives through distribution of publications on hazards and hazard mitigation.**							
3.5.1	Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.	All	High	Short-Range	Building Dept	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.5.2	Distribute FEMA Publication 320 - Taking Shelter from the Storm: Building a Safe Room in Your House - through building permit and inspection offices.	Tornadoes Hurricanes Severe Storms Earthquakes	High	Short-Range	Building Dept	Action	No Additional Cost	Existing Funds
3.5.3	Distribute outreach materials to citizens, builders and business owners inquiring about flood problems or other flood related questions.	Flooding	Med	Mid-Range	City Admin	Action	No Additional Cost	Existing Funds
3.5.7	Provide emergency preparedness information and resources for the protection and care of animals during extended periods of extreme heat or cold.	Extreme Heat Extreme Cold	Low	Mid-Range	Animal Control	Action	No Additional Cost	Existing Funds
3.5.8	Provide outreach materials regarding the appropriate actions to take in the event of a hazardous material release.	Human-Caused	Medium	Mid-Range	Fire Dept, Police, EMA	Action	No Additional Cost	Existing Funds
3.6	**<u>Outreach Projects.</u> Conduct regular public events to inform the public of hazards and mitigation measures.**							
3.6.1	Continue to participate in environmental awareness events to provide the public information on hazard exposure and mitigation measures, such as City/County Day, Hurricane Awareness Week, and severe Weather Week.	All	High	Short-Range	City Gov	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.6.2	Distribute material via the internet and other media, and other outreach activities and workshops to encourage families and individuals to implement hazard mitigation measures in their homes.	All	High	Mid-Range	City IT Dept, Assistant Personnel Director	Action	No Additional Cost	Existing Funds
3.6.5	Develop a fire safety, protection, and prevention outreach program for builders, developers, and the general public.	Wildfire	High	Short-Range	Building Dept, Fire Dept	Action	No Additional Cost	Existing Funds
3.7	**<u>Outreach Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.7.2	Educate students and the public about the "See Something, Say Something" program, including who to contact about suspicions.	Human-Caused	High	Short-Range	Police, Schools	Action	No Additional Cost	Existing Funds
3.7.3	Promote the education of citizens on water saving techniques through the local water boards and area schools.	Drought	Low	On-Going	Boaz Water Board, Northeast Water	Action	No Additional Cost	Existing Funds
3.7.5	Provide emergency preparedness information for extreme temperature events through an active educational outreach program with specific plans and procedures for senior citizens and people with special needs.	Extreme Cold Extreme Heat	High	Short-Range	Senior Center	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.7.6	Educate homeowners about structural and non-structural retrofitting of homes vulnerable to certain hazards.	Tornadoes Hurricanes Severe Storms Earthquakes Flooding	High	Mid-Range	Building	Action	No Additional Cost	Existing Funds
3.7.9	Educate employees in critical facilities about cybersecurity.	Human-Caused	High	Short-Range	Dept Heads, Schools	Action	No Additional Cost	Existing Funds
3.7.10	Enhance public safety through awareness and outreach materials to the public with regards to pandemics.	Pandemic	High	Short - Range	Dept Heads	Action	No Additional Cost	Existing Funds
3.7.11	Educate the public about existing flood warning systems such as Everbridge	Flooding	High	Short-Range	City Admin	Action	No Additional Cost	Existing Funds
3.7.13	Educate staff members on proper mitigation measures of pandemic preparedness	Pandemic	High	On-Going	All Dept Schools	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.7.14	Educate staff members for the utilization of virtual resources for virtual and/or remote learning or communications during closures due to pandemics or other hazards.	Pandemic Human-Caused Technological	High	Short-Range	All Dept Schools	Action	No Additional Cost	Existing Funds
3.7.15	Upgrade technology devices for students and teachers for utilization during virtual and/or remote learning.	Pandemic Human-Caused Technological	High	Short-Range	Schools	Project	TBD	TBD
3.8	**<u>Training and Webinars.</u> Attend training and educational webinars on mitigation of national human caused and technological hazard.**							
3.8.4	Enhance and expand training of fire departments in wildfire hazard areas.	Wildfire	Low	Long-Range	Fire Dept	Action	TBD	TBD
3.8.5	Train operators in snow removal to ensure adequate coverage during severe winter storm events.	Winter Storms	Medium	On-Going	Street Dept	Action	TBD	TBD
3.8.6	Promote training and attendance by employees at conferences and webinars sponsored by agencies such as FEMA, DHS, APHD, AEMA and the Marshall County EMA.	All	High	On-Going	Mayor & Council, Schools	Action	TBD	TBD

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.8.7	Encourage completion of the online course FEMA IS-907 on active shooters by employees in critical facilities.	Human-Caused	High	On-Going	Police, Schools	Action	No Additional Cost	Existing Funds
3.8.8	Encourage the participation of groups in programs offered by the Department of Homeland Security; such as courses on Targeted Violence and Terrorism Prevention.	Human-Caused	High	On-Going	Police	Action	No Additional Cost	Existing Funds
3.8.9	Encourage local agricultural businesses to participate in the Strategic Partnership Program for agroterrorism programs.	Human-Caused	Low	Long-Range	Police	Action	No Additional Cost	Existing Funds
3.8.11	Expand or participate in expanding traditional disaster exercises involving city and county emergency personnel to include airport and port personnel, infrastructure providers, hospitals, schools, and major employers.	All	High	On-Going	Fire Dept, EMA	Action	No Additional Cost	Existing Funds
3.9	**<u>Disaster Warning and Notification.</u> Improve public warning and notification systems.**							

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.9.1	Review existing outdoor warning siren coverage and recommend new locations if and where there are coverage gaps. Install new warning sirens in accordance with the plan recommendations.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	High	Short-Range	Fire Dept, City Admin	Project	TBD	FEMA HMA Grant
3.9.2	Upgrade siren-warning systems.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused	Low	Long-Range	Fire Dept, City Admin	Project	TBD	FEMA HMA Grant
3.9.3	Upgrade critical communications infrastructure.	All	High	Short-Range	Fire Dept, Police	Project	TBD	FEMA HMA Grant
3.9.4	Enter in agreements with surrounding jurisdictions to upgrade communications to the Project 25 Radio system.	All	High	On-Going	Fire Dept, Police	Action	TBD	FEMA HMA Grant

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.9.5	Create a backup site with communications equipment for 911 services.	All	High	On-Going	Fire Dept, Police	Project	TBD	FEMA HMA Grant
3.9.6	Develop the capability to re-route communications from one jurisdiction's 911 communication tower to another jurisdiction's in the event of tower failure.	All	High	On-Going	Fire Dept, Police	Project	TBD	FEMA HMA Grant
3.9.7	Coordinate with utilities and transportation authorities to improve rapid communications between emergency services and the private sector when basic services might be disrupted during extended periods due to disasters.	All	High	On-Going	Fire Dept, Police	Action	No Additional Cost	Existing Funds
3.9.8	Establish procedures to warn facilities storing hazardous materials when a hazard event is likely to impact the facility to ensure safety procedures are enacted.	Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	High	On-Going	Fire Dept, EMA	Action	No Additional Cost	Existing Funds
3.9.9	Evaluate the need for a unified fire advisory system to identify fire risk during extended periods of extreme heat.	Wildfire	High	Short-Range	Fire Dept	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.9.10	Participate in the "Turn Around Don't Drown" program by purchasing and installing signs in known flash flood locations.	Flooding	Medium	Short-Term	Boaz Street	Project	No Additional Cost	Existing Funds
3.9.11	Explore options for improving the ability of local units of government to report flooding and flash flooding events, receive information, respond and request assistance.	Flooding	Low	On-Going	Street Dept, Fire Dept, Police	Action	No Additional Cost	Existing Funds
3.9.12	Ensure first responders are aware of any chemicals stored at the school including those used in the science department.	Tornadoes Severe Storms Earthquakes Human-Caused	High	Short-Range	Schools	Action	No Additional Cost	Existing Funds
3.10	**<u>Weather Radios</u>. Improve public access to weather alerts.**							
3.10.1	Continue to promote the purchase and usage of NOAA weather radios in all schools, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries, and the general public, especially in homes with no outdoor warning siren coverage.	Tornadoes Hurricanes Severe Storms Flooding	Medium	Short-Range	Boaz Fire	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.10.2	Require/encourage the installation of weather radios in all public buildings and places of public assembly.	Tornadoes Hurricanes Severe Storms Flooding	High	Short-Range	EMA	Action	No Additional Cost	Existing Funds
3.10.3	Distribute weather radios and emergency response instructions to municipal residents and businesses.	Tornadoes Hurricanes Severe Storms Flooding	High	Short - Range	City Admin, Fire Dept	Action	TBD	FEMA HMA Grant
3.10.4	Promote the use of weather radios in households and businesses.	Tornadoes Hurricanes Severe Storms Flooding	High	Short - Range	City Admin	Action	No Additional Cost	Existing Funds
3.11	**<u>Mass Media Relations and Websites</u>. Utilize All Available Mass Media, Such As, Newspapers, Radio, TV, Cable Access, Internet Blogs, Podcasts, Video Sharing, On-Line Social Networking, And Government/Agency Websites to Increase Public Awareness and Distribute Public Information on Hazard Mitigation Topics.**							
3.11.1	Maintain appropriate media relationships to ensure the public is informed of hazard threats and means to mitigate property damages and/or loss of life.	All	High	On-Going	City Gov, City Admin	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.11.3	Expand the use of city-sponsored websites to disseminate hazard mitigation information.	All	High	On-Going	City Admin	Action	No Additional Cost	Existing Funds
3.11.4	Include hazard information on school websites to disseminate hazard mitigation information with a focus on family safety.	Tornadoes Severe Storms Earthquakes Human-Caused	High	Short-Range	Schools	Action	No Additional Cost	Existing Funds
4	**Goal for Natural Resources Protection. Preserve and restore the beneficial functions of the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.**							
4.1	**Open Space Easements and Acquisitions. Acquire easements and fee-simple ownership of environmentally beneficial lands, such as hillsides, floodplains, and wetlands to assure permanent protection of these natural resources.**							
4.1.1	Increase open space acquisitions through the FEMA HMA Grant Programs and other floodplain acquisition efforts.	Flooding	Medium	Long - Range	Planning Comm	Project	TBD	FEMA HMA Grant
4.2	**River/Stream Corridor Restoration and Protection. Restore and protect river and stream corridors within areas.**							
4.2.1	Protect wetlands by preventing unsound development that would change their natural condition.	Flooding	High	Mid-Range	Planning Comm	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
4.2.2	Keep builders and developers informed of Federal wetlands permitting requirements of the Corps of Engineers.	Flooding	High	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
4.2.3	Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.	Flooding	High	Short-Range	Building Dept	Action	No Additional Cost	Existing Funds
4.3	**Forestry Programs. Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wildfires inside and outside the urban environment.**							
4.3.1	Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).	Flooding	High	Short-Range	Flood Plain Managers	Action	No Additional Cost	Existing Funds
5	**Goal for Natural System and Infrastructure Improvement and Maintenance Projects. Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where feasible, cost effective, and environmentally suitable.**							
5.1	**Drainage System and Rights-of-Way Maintenance. Improve maintenance programs for streams and drainage ways.**							
5.1.1	Prepare and implement standard operating procedures and guidelines for drainage system maintenance. Ensure storm drains and ditches are not blocked and are able to receive water.	Flooding	High	On-Going	Street Dept	Action	No Additional Cost	Existing Funds

2020 - 2025 Boaz Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
5.1.3	Develop and adopt winter maintenance procedures that include smart salting techniques and applying deicing agents before severe winter storms happen.	Winter Storm	High	On-Going	Street Dept	Action	No Additional Cost	Existing Funds
5.1.4	Collaborate with ALDOT in addressing drainage issues along state roadways.	Flooding	High	On-Going	Street Dept	Action	No Additional Cost	Existing Funds
5.2	**<u>Reservoirs and Drainage System Improvements.</u> Control flooding through reservoirs and other structural improvements, where deemed cost effective and feasible, such as levees/floodwalls, diversions, channel modifications, dredging, drainage modifications, and storm sewers.**							
5.2.1	Construct drainage improvements to reduce or eliminate localized flooding.	Flooding	High	On-Going	Street Dept	Project	TBD	FEMA HMA Grant

2020 - 2025 Douglas Community Action Program								
	Goal, Objectives and Mitigation Measures	Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1	**Goal for Prevention. Manage the development of land and buildings to minimize risks of loss due to multiple hazards.**							
1.2	**Planning Studies. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
1.2.5	Inventory and map existing fire hydrants and piping throughout the town and identify areas in need of new fire hydrants and/ or areas of insufficient water pressure for fire suppression.	Wildfires	Medium	On-Going	VFD	Action	No Additional Cost	Existing Funds
1.2.7	Assist the Alabama Forestry Commission with their Community Wildfire Plan for Marshall County and its jurisdictions.	Wildfire	Low	Long-Range	FD	Action	No Additional Cost	Existing Funds
1.5	**Floodplain Management Regulations and Management. Effectively administer and enforce local floodplain management regulations.**							
1.5.7	Encourage interagency collaboration in management of beaver populations where beaver activities compromise drainage structures and transportation routes.	Flooding	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
1.10	**Critical Facilities Assessments. Perform assessments of critical facilities (hospitals, schools, fire and police stations, emergency operation centers, special needs housing, and others) to address building and site vulnerabilities to hazards, identify damage control and retrofit measures to reduce vulnerability to damage and disruption of operations during severe weather and other natural and human-caused disaster events.**							

2020 - 2025 Douglas Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.10.2	Conduct wildfire vulnerability assessments of critical facilities and other properties in these risk areas and prepare a comprehensive inventory to identify high and moderate wildfire risk areas.	Wildfire	Low	Long-Range	VFD	Action	No Additional Cost	Existing Funds
1.10.3	Inspect security measures around critical facilities for areas of concern (i.e., cut away areas in security fencing, inoperable cameras) and develop a plan to address the concerns.	Human-Caused	Medium	Long-Range	PD	Action	No Additional Cost	Existing Funds
1.10.4	Perform annual penetration and vulnerability assessments of log files and wire data.	Human-Caused	Medium	Long-Range	IT	Action	TBD	TBD
1.10.5	Encourage water suppliers to assess vulnerability of existing supply systems and share that information with local governments.	Human-Caused	Low	Long-Range	VFD	Action	TBD	TBD
1.11	**<u>Geographic Information Systems (GIS) and Information Management</u>. Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories to aid in planning, hazard mitigation and incident reporting.**							
1.11.4	Provide property assessments of areas impacted by hazards for damage/ incident reports. If applicable, add to GIS mapping.	All	Medium	Long-Range	Town Council	Action	TBD	TBD

2020 - 2025 Douglas Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.11.5	Develop a centralized database of all safe rooms and shelters, both pre-disaster and post-disaster, open to the public for all jurisdictions. Include and update those locations in GIS if applicable.	Tornadoes Hurricanes Severe Storms Earthquakes Technological	Medium	Long-Range	VFD	Action	No Additional Cost	Existing Funds
1.11.6	Keep up-to-date lists of addresses with private safe rooms and shelters to assist fire departments and emergency services agencies. Coordinate the distribution of these lists to the appropriate local government officials.	Tornadoes Hurricanes Severe Storms Earthquakes	Medium	Long-Range	VFD	Action	No Additional Cost	Existing Funds
1.11.7	Maintain a listing of locations of special needs groups, including the elderly and those with Alzheimer's. Disseminate that information to emergency personnel.	All	Medium	Long-Range	VFD	Action	No Additional Cost	Existing Funds
1.11.8	Establish a uniform damage reporting procedure for Douglas to utilize with the Marshall County Emergency Management Agency as the clearinghouse for damage assessment data following disaster events.	All	Medium	Long-Range	PD/ VFD	Action	No Additional Cost	Existing Funds
1.13	**<u>Prescribed Burn Regulations and Wildfire Management Programs.</u> Create regulations and programs to reduce storm debris.**							
1.13.1	Support legislation to enact regulations for the timber industry to conduct prescribed burns after clearing land to lessen the possibility of wildfires.	Wildfires	Medium	Long-Range	Town Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Douglas Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.13.2	Encourage programs to conduct prescribed burns of large undeveloped areas of downed trees from disaster events to lessen the possibility of wildfires.	Wildfires	Low	Long-Range	VFD	Action	No Additional Cost	Existing Funds
1.14	**Emergency Operations Plan.**							
1.14.1	Maintain and update emergency operations plans.	All	Medium	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
2	**Goal for Human Welfare and Property Protection: Protect people, animals, structures and contents from the damaging effects of hazards.**							
2.4	**Building Retrofits. Retrofit vulnerable buildings and their surroundings to protect against multiple hazard damages, including flooding, high winds, tornadoes, hurricanes, severe storms, earthquakes, and human-caused hazards.**							
2.4.1	Retrofit existing buildings against potential damages from natural and human-caused hazards.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused	Low	Long-Range	Town Council	Action	TBD	FEMA HMA Grant
2.6	**Critical Facilities Protection. Protect critical facilities from potential damages and occupants from harm in the event of hazards through retrofits or relocations of existing facilities located in high-risk zones, construction of new facilities, or implementation of security measures for maximum protection from all hazards.**							
2.6.1	Retrofit critical facilities and infrastructure against potential damages from hazards.	All*	Low	Long-Range	Town Council	Project	TBD	FEMA HMA Grant

2020 - 2025 Douglas Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.6.6	Encourage the planting of species that are less susceptible to damage and ensure that trees are planted far from above ground utility lines and buildings.	Tornadoes Hurricanes Severe Storms Winter Storms	Low	Long-Range	VFD	Action	No Additional Cost	Existing Funds
2.6.7	Encourage the enhancement of the security of areas surrounding public facilities. Such measures include replacing or removing landscaping that provides cover for attacks, installing motion activated lighting, secure parking lots through fencing and adequate lighting.	Human-Caused	Medium	Long-Range	PD	Action	No Additional Cost	Existing Funds
2.6.8	Encourage structural changes to secure the buildings, i.e., replace vulnerable doors, install automatic door locks for after hours, install alarms and panic alarms, install CCTVs throughout facilities	Human-Caused	Medium	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
2.6.9	Install a public address system throughout public buildings for hazard warnings and shelter-in-place announcements.	Dam Failure Tornadoes Hurricanes Severe Storms Human-Caused Technological	Medium	Long-Range	Town Council	Project	TBD	TBD

2020 - 2025 Douglas Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.6.10	Minimize visitors' access to buildings and provide badges.	Human-Caused	Medium	Long-Range	Town Council	Action	TBD	TBD
2.6.11	Monitor inflow/ outflow of network activity on computer systems in critical facilities to protect against cyberterrorism.	Human-Caused	Medium	Long-Range	IT	Action	No Additional Cost	Existing Funds
2.6.12	Utilize the DHS' free assessment tool for cybersecurity for local governments to find weak areas in cybersecurity and address the issues found.	Human-Caused	Medium	Long-Range	IT	Action	No Additional Cost	Existing Funds
2.7	**<u>Back Up Power.</u> Assure uninterrupted power supplies during emergency events.**							
2.7.1	Install or encourage the installation of backup power generators for critical facilities.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	Medium	Long-Range	Town Council	Project	TBD	BRIC HMGP

2020 - 2025 Douglas Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.7.2	Deploy portable generators to serve as miniature sub-stations to help rapidly restore power to at-risk citizens after a hazard event.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	Medium	Long-Range	VFD	Project	TBD	TBD
2.8	**<u>Community Shelters and Safe Rooms</u>: Provide shelter from multiple hazards for the safety of community residents.**							
2.8.1	Work with town leaders in developing standardized procedures for identifying shelters as pre-disaster and post-disaster shelters or safe rooms.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	PD	Action	No Additional Cost	Existing Funds
2.8.2	Review existing public shelters and safe rooms and recommend new locations if and where there are coverage gaps. Include evaluations on ADA compliance and sheltering of animals.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	VFD	Action	No Additional Cost	Existing Funds
2.8.3	Work with the American Red Cross (ARC) in developing "Memorandums of Understanding" (MOUs) with facility owners that serve as shelters.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	Town Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Douglas Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.8.4	Determine how to accommodate individuals with special needs both in the emergency operations plan for the shelter or safe room and in the design of the shelter or safe room, including compliance with the American with Disabilities Act (ADA).	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	VFD	Action	No Additional Cost	Existing Funds
2.8.5	Evaluate the need for severe weather plans and shelters in essential facilities and other establishments serving the public (e.g., schools, hospitals, and critical facilities).	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	Town Council	Action	No Additional Cost	Existing Funds
2.8.7	Establish a program for subsidizing individual and community safe room construction in existing facilities.	Hurricanes Tornadoes Severe Storms Earthquakes	Low	Long-Range	Town Council	Project	TBD	FEMA HMA Grant
2.8.9	Determine which areas at important facilities such as schools and daycare centers are the best locations for occupants during a disaster. Identify and provide directions to the designated “safe place.”	Tornadoes Hurricanes Severe Storms Technological	High	On-Going	PD/ VFD	Action	TBD	Existing Funds

2020 - 2025 Douglas Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.8.10	Ensure all public buildings have a refuge plan of where to send people during times of disasters. Encourage posting of the plan in places accessible to the public.	Dam Failure Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	Medium	On-Going	PD/ VFD	Action	TBD	Existing Funds
2.8.11	Establish mutual agreements with other jurisdictions and agencies to help with sheltering of animals during disasters.	Tornadoes Hurricanes Severe Storms	Medium	On-Going	PD	Action	No Additional Cost	Existing Funds
2.8.12	Evaluate existing public shelters and safe places for areas for sheltering pets.	Tornadoes Hurricanes Severe Storms	Medium	On-Going	PD/ VFD	Action	No Additional Cost	Existing Funds
2.8.13	Evaluate future plans for public shelters and safe places for sheltering pets.	Tornadoes Hurricanes Severe Storms	Medium	On-Going	PD/ VFD	Action	No Additional Cost	Existing Funds
2.9	**Human Welfare.**							
2.9.1	Increase collaboration between government and community organizations regarding containment and response plans for epidemic events involving humans.	Pandemic	High	On-Going	Town Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Douglas Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.9.2	Continue to support the Area 2 Region Public Health Team in planning and training events such as the Drive-Thru-Flu clinic Exercise, Point of Distribution SNS Exercises and other MMRS activities.	Pandemic	High	On-Going	PD/ VFD	Action	TBD	Existing Funds
2.9.3	Identify and secure resources to build the appropriate medical stockpile of medicines and medical supplies to address sizable epidemics through the MMRS-SNS and Area 2 Public Health Plans	Pandemic	High	On-Going	Town Council	Action	TBD	TBD
3	**Goal for Education, Outreach and Awareness. Educate and inform the public, and government and agency staff about the risks of hazards and ways to reduce threats to life and property.**							
3.1	**Community Hazard Mitigation Plan Distribution. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.1.1	Distribute the 2020 plan to local officials, stakeholders, and interested individuals through internet download.	All	High	Short-Range	Town Council	Action	No Additional Cost	Existing Funds
3.4	**Hazard Insurance Awareness. Increase public awareness of flood insurance and special riders that may be required for earthquake, landslide, sinkhole, and other damages typically not covered by standard property protection policies.**							

2020 - 2025 Douglas Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.4.1	Promote the purchase of insurance coverage by property owners and renters for flood damages and other hazards in high-risk areas.	Flooding Earthquakes Landslides Land Subsidence Human-Caused	Medium	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
3.4.3	Promote the purchase of crop insurance by farmers to cover potential losses due to drought.	Drought	Low	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
3.5	**Publication Distribution. Use local library resources and other agencies/ departments to educate the public on hazard risks and mitigation alternatives through distribution of publications on hazards and hazard mitigation.**							
3.5.2	Distribute FEMA Publication 320 - Taking Shelter from the Storm: Building a Safe Room in Your House - through building permit and inspection offices.	Tornadoes Hurricanes Severe Storms Earthquakes	Medium	Long-Range	VFD	Action	No Additional Cost	Existing Funds
3.5.6	Promote technical information from agencies such as the Insurance Institute for Business and Home Safety and Federal Alliance for Safe Homes.	Tornadoes Hurricanes Severe Storms Earthquakes	Low	Long-Range	VFD	Action	No Additional Cost	Existing Funds
3.5.7	Provide emergency preparedness information and resources for the protection and care of animals during extended periods of extreme heat or cold.	Extreme Heat Extreme Cold	Medium	Long-Range	VFD	Action	No Additional Cost	Existing Funds

2020 - 2025 Douglas Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.5.8	Provide outreach materials regarding the appropriate actions to take in the event of a hazardous material release.	Human-Caused	High	Mid-Range	VFD	Action	No Additional Cost	Existing Funds
3.6	**<u>Outreach Projects.</u> Conduct regular public events to inform the public of hazards and mitigation measures.**							
3.6.1	Continue to participate in environmental awareness events to provide the public information on hazard exposure and mitigation measures, such as City/ County Day, Hurricane Awareness Week, and severe Weather Week.	All	Medium	On-Going	PD/ VFD	Action	No Additional Cost	Existing Funds
3.6.2	Distribute material via the internet and other media, and other outreach activities and workshops to encourage families and individuals to implement hazard mitigation measures in their homes.	All	Low	Long-Range	VFD	Action	No Additional Cost	Existing Funds
3.6.4	Promote awareness of human-caused and technological hazards through workshops, educational materials and planning guides to businesses and the general public.	Human-Caused Technological	Low	Long-Range	Town Council	Action	TBD	Existing Funds
3.6.6	Develop an educational public awareness campaign informing citizens of land management and landscaping options to limit wildfire spread.	Wildfire	Low	On-Going	VFD	Action	No Additional Cost	Existing Funds

2020 - 2025 Douglas Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.6.7	Educate homeowners about the urban – wildland interface and proper plantings and landscaping practices to prevent wildfire destruction.	Wildfire	Low	On-Going	VFD	Action	No Additional Cost	Existing Funds
3.7	**<u>Outreach Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.7.2	Educate students and the public about the "See Something, Say Something" program, including who to contact about suspicions.	Human-Caused	Medium	On-Going	PD	Action	No Additional Cost	Existing Funds
3.7.3	Promote the education of citizens on water saving techniques through the local water boards and area schools.	Drought	Low	On-Going	VFD	Action	No Additional Cost	Existing Funds
3.7.5	Provide emergency preparedness for extreme temperature events through an active educational outreach program with specific plans and procedures for senior citizens and people with special needs.	Extreme Cold Extreme Heat	Low	On-Going	PD/ VFD	Action	No Additional Cost	Existing Funds
3.7.6	Educate homeowners about structural and non-structural retrofitting of homes vulnerable to certain hazards.	Tornadoes Hurricanes Severe Storms Earthquakes Flooding	Low	Long-Range	VFD	Action	No Additional Cost	Existing Funds

2020 - 2025 Douglas Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.7.7	Educate those in areas without building codes about safer building practices such as the use of fire-resistant materials in construction.	Tornadoes Hurricanes Severe Storms Earthquakes Wildfire	Low	Long-Range	VFD	Action	No Additional Cost	Existing Funds
3.7.8	Educate the citizens about proper procedures for sheltering in place.	Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	High	On-Going	PD/ VFD	Action	No Additional Cost	Existing Funds
3.7.9	Educate employees in critical facilities about cybersecurity.	Human-Caused	High	On-Going	IT	Action	No Additional Cost	Existing Funds
3.7.10	Enhance public safety through awareness and outreach materials to the public with regards to pandemics.	Pandemic	High	On-Going	PD/ VFD	Action	No Additional Cost	Existing Funds
3.7.11	Educate the public about existing flood warning systems such as Everbridge	Flooding	High	On-Going	VFD	Action	No Additional Cost	Existing Funds

2020 - 2025 Douglas Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.7.13	Educate staff members on proper mitigation measures of pandemic preparedness	Pandemic	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
3.7.14	Educate staff members for the utilization of virtual resources for virtual and/or remote learning or communications during closures due to pandemics or other hazards.	Pandemic Human-Caused Technological	High	Short-Range	Schools	Action	No Additional Cost	Existing Funds
3.7.15	Upgrade technology devices for students and teachers for utilization during virtual and/or remote learning.	Pandemic	High	Short-Range	Schools	Project	No Additional Cost	Existing Funds
3.8	**<u>Training and Webinars.</u> Attend training and educational webinars on mitigation of national human caused and technological hazard.**							
3.8.3	Organize local veterinarians to educate the public and emergency personnel through workshops on the handling of pets, livestock, and wild animals during disasters .	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Medium	Long-Range	PD/ VFD	Action	No Additional Cost	Existing Funds
3.8.4	Enhance and expand training of fire departments in wildfire hazard areas.	Wildfire	Low	Long-Range	VFD	Action	TBD	TBD

2020 - 2025 Douglas Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.8.8	Encourage the participation of groups in programs offered by the Department of Homeland Security; such as courses on Targeted Violence and Terrorism Prevention.	Human-Caused	Medium	Long-Range	PD	Action	No Additional Cost	Existing Funds
3.8.9	Encourage local agricultural businesses to participate in the Strategic Partnership Program for agroterrorism programs.	Human-Caused	Low	Long-Range	VFD	Action	No Additional Cost	Existing Funds
3.8.10	Encourage participation by livestock and poultry farmers in programs offered by the USDA such as "Biosecurity for the Birds".	Human-Caused	Low	Long-Range	VFD	Action	No Additional Cost	Existing Funds
3.8.11	Expand or participate in expanding traditional disaster exercises involving town and county emergency personnel to include airport and port personnel, infrastructure providers, hospitals, schools, and major employers.	All	Medium	On-Going	PD/ VFD	Action	No Additional Cost	Existing Funds
3.9	**Disaster Warning and Notification. Improve public warning and notification systems.**							

2020 - 2025 Douglas Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.9.1	Review existing outdoor warning siren coverage and recommend new locations if and where there are coverage gaps. Install new warning sirens in accordance with the plan recommendations.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Medium	MR	PD	Project	TBD	FEMA HMA Grant
3.9.2	Upgrade siren-warning systems.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused	Medium	Long-Range	PD	Project	TBD	FEMA HMA Grant
3.9.4	Enter in agreements with surrounding jurisdictions to upgrade communications to the Project 25 Radio system.	All	High	Short-Range	PD	Action	TBD	FEMA HMA Grant

2020 - 2025 Douglas Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.9.7	Coordinate with utilities and transportation authorities to improve rapid communications between emergency services and the private sector when basic services might be disrupted during extended periods due to disasters.	All	Medium	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
3.9.8	Establish procedures to warn facilities storing hazardous materials when a hazard event is likely to impact the facility to ensure safety procedures are enacted.	Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Medium	Long-Range	VFD	Action	No Additional Cost	Existing Funds
3.9.10	Participate in the "Turn Around Don't Drown" program by purchasing and installing signs in known flash flood locations.	Flooding	Medium	Mid-Range	VFD	Project	No Additional Cost	Existing Funds
3.9.11	Explore options for improving the ability of local units of government to report flooding and flash flooding events, receive information, respond and request assistance.	Flooding	Low	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
3.10	**<u>Weather Radios</u>. Improve public access to weather alerts.**							

2020 - 2025 Douglas Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.10.1	Continue to promote the purchase and usage of NOAA weather radios in all schools, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries, and the general public, especially in homes with no outdoor warning siren coverage.	Tornadoes Hurricanes Severe Storms Flooding	High	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.10.2	Require/ encourage the installation of weather radios in all public buildings and places of public assembly.	Tornadoes Hurricanes Severe Storms Flooding	High	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.10.4	Promote the use of weather radios in households and businesses.	Tornadoes Hurricanes Severe Storms Flooding	High	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.11	**Mass Media Relations and Websites. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, on-line social networking, and government/ agency websites to increase public awareness and distribute public information on hazard mitigation topics.**							
3.11.1	Maintain appropriate media relationships to ensure the public is informed of hazard threats and means to mitigate property damages and/ or loss of life.	All	High	On-Going	Town Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Douglas Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.11.2	Increase media coverage of threat and evacuation procedures during peak wildfire times of the year; distribute informational packages in high and moderate wildfire risk areas.	Wildfire	Medium	On-Going	VFD	Action	No Additional Cost	Existing Funds
3.11.3	Expand the use of town-sponsored websites to disseminate hazard mitigation information.	All	Medium	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
3.11.4	Include hazard information on school websites to disseminate hazard mitigation information with a focus on family safety.	All	Low	On-Going	Schools	Action	No Additional Cost	Existing Funds
4	**Goal for Natural Resources Protection. Preserve and restore the beneficial functions of the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.**							
4.2	**River/Stream Corridor Restoration and Protection. Restore and protect river and stream corridors within areas.**							
4.2.1	Protect wetlands by preventing unsound development that would change their natural condition.	Flooding	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
4.3	**Forestry Programs. Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wildfires inside and outside the urban environment.**							
4.3.3	Develop maintenance programs to clear dead and dry bushes or trees to mitigate wildfires.	Wildfire	Low	Long-Range	VFD	Action	No Additional Cost	Existing Funds

2020 - 2025 Douglas Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
4.3.4	Use controlled burns to decrease the amount of fuel load in the identified moderate and high wildfire hazard areas.	Wildfire	Low	Long-Range	VFD	Project	TBD	FMA
4.3.5	Encourage Volunteer Fire Departments to improve capabilities for responding to and extinguishing wildfires.	Wildfires	High	On-Going	VFD	Action	No Additional Cost	Existing Funds
4.4	**<u>Water Resources Conservation Programs.</u> Protect water quantity and quality through water conservation programs to mitigate the effects of droughts and assure uninterrupted potable water supplies.**							
4.4.1	Encourage water conservation through public outreach programs prior to a drought event.	Drought	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
5	**<u>Goal for Natural System and Infrastructure Improvement and Maintenance Projects.</u> Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where feasible, cost effective, and environmentally suitable.**							
5.1	**<u>Drainage System and Rights-of-Way Maintenance.</u> Improve maintenance programs for streams and drainage ways.**							
5.1.2	Employ prescribed burns of natural debris along streams and in ditches to enhance storm drainage.	Flooding	Low	Long-Range	VFD	Action	No Additional Cost	Existing Funds

2020 - 2025 Grant Community Action Program								
	Goal, Objectives and Mitigation Measures	Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1	**Goal for Prevention. Manage the development of land and buildings to minimize risks of loss due to multiple hazards.**							
1.1	**Comprehensive Plans and Smart Growth. Establish an active comprehensive planning program that is consistent with Smart Growth principles of sustainable community development.**							
1.1.2	Integrate the findings and recommendations of this hazard mitigation plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	High	On-Going	Council	Action	TBD	TBD
1.1.3	Prepare a five-year capital improvements plan (CIP) to include capital projects that implement the natural, human-caused, and technological hazard element of the community's comprehensive plan or projects identified in the Community Mitigation Action Program of this multi-hazard mitigation plan.	All	Low	Long-Range	Council	Action	TBD	TBD
1.2	**Planning Studies. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
1.2.5	Inventory and map existing fire hydrants and piping throughout the town and identify areas in need of new fire hydrants and/or areas of insufficient water pressure for fire suppression.	Wildfires	Medium	Short-Range	VFD	Action	No Additional Cost	Existing Funds

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.2.6	Update Wide Hazardous Flow Study, Fixed Site Tier II Reporting Facilities every 3 years.	Technological	Low	Long-Range	Council	Action	No Additional Cost	Existing Funds
1.2.7	Assist the Alabama Forestry Commission with their Community Wildfire Plan for Marshall County and its jurisdictions.	Wildfire	Low	Long-Range	FD	Action	No Additional Cost	Existing Funds
1.3	**<u>Zoning and Subdivision Regulations</u>. Establish effective zoning and subdivision controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							
1.3.1	Require/encourage new subdivisions to implement fire reduction measures such as maintaining minimum intervals between structures, providing firebreaks, on-site water storage, wide roads and multiple accesses are measures to reduce fire risks.	Wildfires	Medium	Long-Range	Council	Action	No Additional Cost	Existing Funds
1.3.6	Enact local ordinances that require community storm shelters within sizeable mobile home parks, apartment complexes, RV parks and other planned communities.	Tornadoes Hurricanes Severe Storms	Medium	Mid-Range	Council	Action	No Additional Cost	Existing Funds
1.4	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from multi-hazard damages.**							
1.4.2	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	Tornadoes Hurricanes Severe Storms Earthquakes	High	On-Going	Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.4.4	Through local subdivision and land development regulations require the placement of all new utility lines underground for large residential subdivisions and commercial developments.	Tornadoes Severe Storms Winter Storms Hurricanes	Medium	Mid-Range	Council	Action	TBD	TBD
1.4.5	Review fire safety ordinances to ensure they properly regulate open burning.	Wildfires	Medium	Short-Range	VFD	Action	No Additional Cost	Existing Funds
1.4.6	Require the construction of safe rooms within new public buildings, such as new schools, libraries, community centers, and other public buildings by amending applicable ordinances and regulations.	Tornadoes Hurricanes Severe Storms Human-Caused Technological	Low	Long-Range	Council	Action	No Additional Cost	Existing Funds
1.5	**<u>Floodplain Management Program.</u> Effectively administer and enforce local floodplain management regulations.**							
1.5.2	Develop guidelines for management of development around flood prone areas and other areas of high flood mitigation values, such as, wetlands, floodplain corridors, upland storage, closed depressional basins and areas of high filtration potential.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.5.3	Improve flood risk assessment by monitoring flood events and damages, documenting high water marks post event, verification of FEMA's repetitive loss inventory and revising and updating regulatory floodplain maps.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.4	Train local floodplain managers through programs offered by the State Floodplain Coordinator and FEMA's training center in Emmitsburg, Maryland.	Flooding	Low	On-Going	Floodplain Manager	Action	TBD	Existing Funds
1.5.5	Maintain membership for locally designated floodplain managers in the Association of State Floodplain Managers and the Alabama Association Floodplain Managers and encourage active participation.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.8	Update local floodplain ordinance for compliance with current NFIP standards.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.5.9	Continue ongoing relations with the State NFIP Coordinator in relation to floodplain management.	Flooding	Low	On-Going	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.6	**<u>Community Rating System Program (CRS).</u> Increase participation of NFIP member communities in the CRS Program.**							
1.6.1	Apply for membership in the CRS Program.	Flooding	Low	Long-Range	Floodplain Manager	Action	No Additional Cost	Existing Funds

2020 - 2025 Grant Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.7	**Storm Water Management. Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**							
1.7.2	Develop, adopt, and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Flooding	Medium	Short-Range	Council	Action	No Additional Cost	Existing Funds
1.9	**Landscape Ordinances. Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff, damage from wind events, mitigate wildfires and improve urban aesthetics.**							
1.9.2	Establish ordinances to help mitigate fire hazards related to fuel buildup due to disasters.	Wildfires	Medium	Mid-Range	Council	Action	No Additional Cost	Existing Funds
1.10	**Critical Facilities Assessments. Perform assessments of critical facilities (hospitals, schools, fire and police stations, emergency operation centers, special needs housing, and others) to address building and site vulnerabilities to hazards, identify damage control and retrofit measures to reduce vulnerability to damage and disruption of operations during severe weather and other natural and human-caused disaster events.**							
1.10.3	Inspect security measures around critical facilities for areas of concern (i.e., cut away areas in security fencing, inoperable cameras) and develop a plan to address the concerns.	Human-Caused	High	Short-Range	Council	Action	No Additional Cost	Existing Funds
1.10.4	Perform annual penetration and vulnerability assessments of log files and wire data.	Human-Caused	High	Mid-Range	Council	Action	TBD	TBD

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.10.5	Encourage water suppliers to assess vulnerability of existing supply systems and share that information with local governments.	Human-Caused	Medium	Mid-Range	Council	Action	TBD	TBD
1.11	**<u>Geographic Information Systems (GIS) and Information Management</u>. Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories to aid in planning, hazard mitigation and incident reporting.**							
1.11.1	Maintain a hazards and risk assessment database that is accessible to local planners and emergency management personnel, including such data as, flood zones, geohazards, tornado tracks, disaster events and their extents, major drainage structures and a comprehensive inventory of critical facilities, including points of distribution within all jurisdictions. If applicable, add to GIS mapping.	All	Medium	Short-Range	Council	Action	No Additional Cost	Existing Funds
1.11.5	Develop a centralized database of all safe rooms and shelters, both pre-disaster and post-disaster, open to the public for all jurisdictions. Include and update those locations in GIS if applicable.	Tornadoes Hurricanes Severe Storms Earthquakes Technological	Medium	Short-Range	council	Action	No Additional Cost	Existing Funds

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.11.6	Keep up-to-date lists of addresses with private safe rooms and shelters to assist fire departments and emergency services agencies. Coordinate the distribution of these lists to the appropriate local government officials.	Tornadoes Hurricanes Severe Storms Earthquakes	Low	On-Going	Council	Action	No Additional Cost	Existing Funds
1.11.7	Maintain a listing of locations of special needs groups, including the elderly and those with Alzheimer's. Disseminate that information to emergency personnel.	All	Low	On-Going	Council	Action	No Additional Cost	Existing Funds
1.13	**Prescribed Burn Regulations and Wildfire Management Programs. Create regulations and programs to reduce storm debris.**							
1.13.1	Support legislation to enact regulations for the timber industry to conduct prescribed burns after clearing land to lessen the possibility of wildfires.	Wildfires	Low	On-Going	Council	Action	No Additional Cost	Existing Funds
1.14	**Emergency Operations Plan.**							
1.14.1	Maintain and update emergency operations plans.	All	High	Short-Range	Council	Action	No Additional Cost	Existing Funds
2	**Goal for Human Welfare and Property Protection: Protect people, animals, structures and contents from the damaging effects of hazards.**							
2.4	**Building Retrofits. Retrofit vulnerable buildings and their surroundings to protect against multiple hazard damages, including flooding, high winds, tornadoes, hurricanes, severe storms, earthquakes, and human-caused hazards.**							

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.4.1	Retrofit existing buildings against potential damages from natural and human-caused hazards.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused	Low	On-Going	Council	Action	TBD	FEMA HMA Grant
2.6	**<u>Critical Facilities Protection</u>. Protect critical facilities from potential damages and occupants from harm in the event of hazards through retrofits or relocations of existing facilities located in high-risk zones, construction of new facilities, or implementation of security measures for maximum protection from all hazards.**							
2.6.1	Retrofit critical facilities and infrastructure against potential damages from hazards.	All*	Low	On-Going	Council	Project	TBD	FEMA HMA Grant
2.6.3	Install lightning and/or surge protection on existing critical facilities.	Lightning	High	Short-Range	Town Maintenance	Project	TBD	TBD
2.6.4	Require lightning and/or surge protection on new critical facilities.	Lightning	High	On-Going	Council	Project	No Additional Cost	Existing Funds
2.6.7	Encourage the enhancement of the security of areas surrounding public facilities. Such measures include replacing or removing landscaping that provides cover for attacks, installing motion activated lighting, secure parking lots through fencing and adequate lighting.	Human-Caused	Medium	Mid-Range	Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.6.8	Encourage structural changes to secure the buildings, i.e., replace vulnerable doors, install automatic door locks for after hours, install alarms and panic alarms, install CCTVs throughout facilities	Human-Caused	Low	Long-Range	Council	Action	No Additional Cost	Existing Funds
2.6.9	Install a public address system throughout public buildings for hazard warnings and shelter-in-place announcements.	Dam Failure Tornadoes Hurricanes Severe Storms Human-Caused Technological	Medium	Mid-Range	Council	Project	TBD	TBD
2.6.11	Monitor inflow/outflow of network activity on computer systems in critical facilities to protect against cyberterrorism.	Human-Caused	Low	On-Going	IT	Action	No Additional Cost	Existing Funds
2.6.12	Utilize the DHS' free assessment tool for cybersecurity for local governments to find weak areas in cybersecurity and address the issues found.	Human-Caused	High	Short-Range	Council	Action	No Additional Cost	Existing Funds
2.7	**<u>Back Up Power.</u> Assure uninterrupted power supplies during emergency events.**							

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.7.1	Install or encourage the installation of backup power generators for critical facilities, including radio stations, and fuel stations.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	Medium	Long-Range	Town Council	Project	TBD	BRIC HMGP
2.7.2	Deploy portable generators to serve as miniature sub-stations to help rapidly restore power to at-risk citizens after a hazard event.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	Medium	Long-Range	Council	Project	TBD	TBD
2.8	**<u>Community Shelters and Safe Rooms</u>: Provide shelter from multiple hazards for the safety of community residents.**							
2.8.1	Work with town leaders in developing standardized procedures for identifying shelters as pre-disaster and post-disaster shelters or safe rooms.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Medium	Long-Range	Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.8.2	Review existing public shelters and safe rooms and recommend new locations if and where there are coverage gaps. Include evaluations on ADA compliance and sheltering of animals.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Medium	Long-Range	Council	Action	No Additional Cost	Existing Funds
2.8.5	Evaluate the need for severe weather plans and shelters in essential facilities and other establishments serving the public (e.g., schools, hospitals, and critical facilities).	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Medium	Long-Range	council	Action	No Additional Cost	Existing Funds
2.8.9	Determine which areas at important facilities such as schools and daycare centers are the best locations for occupants during a disaster. Identify and provide directions to the designated “safe place.”	Tornadoes Hurricanes Severe Storms Technological	Medium	Short-Range	council	Action	TBD	Existing Funds
2.8.10	Ensure all public buildings have a refuge plan of where to send people during times of disasters. Encourage posting of the plan in places accessible to the public.	Dam Failure Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	Medium	Short-Range	council	Action	TBD	Existing Funds

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.8.12	Evaluate existing public shelters and safe places for areas for sheltering pets.	Tornadoes Hurricanes Severe Storms	Low	Long-Range	Council	Action	No Additional Cost	Existing Funds
2.8.13	Evaluate future plans for public shelters and safe places for sheltering pets.	Tornadoes Hurricanes Severe Storms	Low	Long-Range	Council	Action	No Additional Cost	Existing Funds
2.9	**Human Welfare.**							
2.9.1	Increase collaboration between government and community organizations regarding containment and response plans for epidemic events involving humans.	Pandemic	Medium	Mid-Range	Council	Action	No Additional Cost	Existing Funds
2.9.2	Continue to support the Area 2 Region Public Health Team in planning and training events such as the Drive-Thru-Flu clinic Exercise, Point of Distribution SNS Exercises and other MMRS activities.	Pandemic	High	On-Going	Council	Action	TBD	Existing Funds
2.9.3	Identify and secure resources to build the appropriate medical stockpile of medicines and medical supplies to address sizable epidemics through the MMRS-SNS and Area 2 Public Health Plans	Pandemic	Medium	Mid-Range	Council	Action	TBD	TBD

2020 - 2025 Grant Community Action Program								
	Goal, Objectives and Mitigation Measures	Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3	**Goal for Education, Outreach and Awareness. Educate and inform the public, and government and agency staff about the risks of hazards and ways to reduce threats to life and property.**							
3.1	**Community Hazard Mitigation Plan Distribution. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.1.1	Distribute the 2020 plan to local officials, stakeholders, and interested individuals through internet download.	All	High	Short-Range	Town Clerk	Action	No Additional Cost	Existing Funds
3.3	**Flood Map Information. Increase public access to Flood Insurance Rate Map (FIRM) information.**							
3.3.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications, newspaper announcements and other media related outreach events.	Flooding	Low	Long-Range	Council	Action	TBD	FEMA CTP
3.3.2	Inform builders and property owners about complying with the latest NFIP standards.	Flooding	Low	Long-Range	Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.5	**<u>Publication Distribution.</u> Use local library resources and other agencies/departments to educate the public on hazard risks and mitigation alternatives through distribution of publications on hazards and hazard mitigation.**							
3.5.1	Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.	All	High	Short-Range	Council	Action	No Additional Cost	Existing Funds
3.5.4	Implement and distribute "Drought Dos and Don'ts" to the general public.	Drought	Low	Long-Range	Council	Action	No Additional Cost	Existing Funds
3.5.6	Promote technical information from agencies such as the Insurance Institute for Business and Home Safety and Federal Alliance for Safe Homes.	Tornadoes Hurricanes Severe Storms Earthquakes	Medium	On-Going	Council	Action	No Additional Cost	Existing Funds
3.5.7	Provide emergency preparedness information and resources for the protection and care of animals during extended periods of extreme heat or cold.	Extreme Heat Extreme Cold	Medium	On-Going	Council	Action	No Additional Cost	Existing Funds
3.5.8	Provide outreach materials regarding the appropriate actions to take in the event of a hazardous material release.	Human-Caused	Medium	On-Going	Council	Action	No Additional Cost	Existing Funds
3.6	**<u>Outreach Projects.</u> Conduct regular public events to inform the public of hazards and mitigation measures.**							

2020 - 2025 Grant Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.6.1	Continue to participate in environmental awareness events to provide the public information on hazard exposure and mitigation measures, such as City/County Day, Hurricane Awareness Week, and severe Weather Week.	All	High	On-Going	Council	Action	No Additional Cost	Existing Funds
3.6.2	Distribute material via the internet and other media, and other outreach activities and workshops to encourage families and individuals to implement hazard mitigation measures in their homes.	All	High	On-Going	Town Clerk	Action	No Additional Cost	Existing Funds
3.7	**<u>Outreach Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.7.1	Distribute hazard mitigation brochures to students through area schools.	All	Medium	Mid-Range	Council	Action	No Additional Cost	Existing Funds
3.7.2	Educate students and the public about the “See Something, Say Something” program, including who to contact about suspicions.	Human-Caused	Medium	Mid-Range	Council	Action	No Additional Cost	Existing Funds
3.7.3	Promote the education of citizens on water saving techniques through the local water boards and area schools.	Drought	Medium	Mid-Range	Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.7.5	Provide emergency preparedness for extreme temperature events through an active educational outreach program with specific plans and procedures for senior citizens and people with special needs.	Extreme Cold Extreme Heat	Medium	Mid-Range	Council	Action	No Additional Cost	Existing Funds
3.7.7	Educate those in areas without building codes about safer building practices such as the use of fire-resistant materials in construction.	Tornadoes Hurricanes Severe Storms Earthquakes Wildfire	Medium	Long-Range	council	Action	No Additional Cost	Existing Funds
3.7.8	Educate the citizens about proper procedures for sheltering in place.	Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	Medium	Long-Range	council	Action	No Additional Cost	Existing Funds
3.7.9	Educate employees in critical facilities about cybersecurity.	Human-Caused	High	Short-Range	council	Action	No Additional Cost	Existing Funds
3.8	**<u>Training and Webinars.</u> Attend training and educational webinars on mitigation of national human caused and technological hazard.**							

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.8.6	Promote training and attendance by employees at conferences and webinars sponsored by agencies such as FEMA, DHS, APHD, AEMA and the Marshall County EMA.	All	Medium	On-Going	Council	Action	TBD	TBD
3.8.7	Encourage completion of the online course FEMA IS-907 on active shooters by employees in critical facilities.	Human-Caused	High	Short-Range	Council	Action	No Additional Cost	Existing Funds
3.8.8	Encourage the participation of groups in programs offered by the Department of Homeland Security; such as courses on Targeted Violence and Terrorism Prevention.	Human-Caused	High	Short-Range	Council	Action	No Additional Cost	Existing Funds
3.9	**<u>Disaster Warning and Notification.</u> Improve public warning and notification systems.**							
3.9.1	Review existing outdoor warning siren coverage and recommend new locations if and where there are coverage gaps. Install new warning sirens in accordance with the plan recommendations.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Medium	Long-Range	Council	Project	TBD	FEMA HMA Grant

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.9.3	Upgrade critical communications infrastructure.	All	Low	Long-Range	Council	Project	TBD	FEMA HMA Grant
3.9.8	Establish procedures to warn facilities storing hazardous materials when a hazard event is likely to impact the facility to ensure safety procedures are enacted.	Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Medium	Short-Range	Council	Action	No Additional Cost	Existing Funds
3.9.11	Explore options for improving the ability of local units of government to report flooding and flash flooding events, receive information, respond, and request assistance.	Flooding	Medium	Short-Range	Council	Action	No Additional Cost	Existing Funds
3.10	**<u>Weather Radios</u>. Improve public access to weather alerts.**							
3.10.1	Continue to promote the purchase and usage of NOAA weather radios in all schools, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries, and the general public, especially in homes with no outdoor warning siren coverage.	Tornadoes Hurricanes Severe Storms Flooding	High	Short-Range	Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.10.2	Require/encourage the installation of weather radios in all public buildings and places of public assembly.	Tornadoes Hurricanes Severe StormsFlooding	High	Short-Range	Council	Action	No Additional Cost	Existing Funds
3.10.3	Distribute weather radios and emergency response instructions to municipal residents and businesses.	Tornadoes Hurricanes Severe Storms Flooding	Low	Long-Range	Council	Action	TBD	FEMA HMA Grant
3.10.4	Promote the use of weather radios in households and businesses.	Tornadoes Hurricanes Severe Storms Flooding	High	Short-Range	Council	Action	No Additional Cost	Existing Funds
3.11	**<u>Mass Media Relations and Websites</u>. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, on-line social networking, and government/agency websites to increase public awareness and distribute public information on hazard mitigation topics.**							

2020 - 2025 Grant Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.11.1	Maintain appropriate media relationships to ensure the public is informed of hazard threats and means to mitigate property damages and/or loss of life.	All	High	On-Going	Council	Action	No Additional Cost	Existing Funds
4.3	**<u>Forestry Programs.</u> Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wildfires inside and outside the urban environment.**							
4.3.5	Encourage Volunteer Fire Departments to improve capabilities for responding to and extinguishing wildfires.	Wildfires	Medium	Mid-Range	Council	Action	No Additional Cost	Existing Funds
4.4	**<u>Water Resources Conservation Programs.</u> Protect water quantity and quality through water conservation programs to mitigate the effects of droughts and assure uninterrupted potable water supplies.**							
4.4.1	Encourage water conservation through public outreach programs prior to a drought event.	Drought	Medium	Long-Range	Council	Action	No Additional Cost	Existing Funds
4.4.4	Encourage the implementation of programs by utilities for water metering and leak detection programs.	Drought	Low	Long-Range	Council	Action	No Additional Cost	Existing Funds
5	**<u>Goal for Natural System and Infrastructure Improvement and Maintenance Projects.</u> Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where feasible, cost effective, and environmentally suitable.**							

2020 - 2025 Grant Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
5.2	**<u>Reservoirs and Drainage System Improvements.</u> Control flooding through reservoirs and other structural improvements, where deemed cost effective and feasible, such as levees/floodwalls, diversions, channel modifications, dredging, drainage modifications, and storm sewers.**							
5.2.1	Construct drainage improvements to reduce or eliminate localized flooding.	Flooding	Medium	On-Going	Council	Project	TBD	FEMA HMA Grant

2020 - 2025 Guntersville Community Action Program								
	Goal, Objectives and Mitigation Measures	Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Depts Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1	**Goal for Prevention. Manage the development of land and buildings to minimize risks of loss due to multiple hazards.**							
1.1	**Comprehensive Plans and Smart Growth. Establish an active comprehensive planning program that is consistent with Smart Growth principles of sustainable community development.**							
1.1.1	Maintain up-to-date comprehensive plan.	All	High	Short-Range	All Depts	Action	TBD	TBD
1.1.2	Integrate the findings and recommendations of this hazard mitigation plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	Medium	On-Going	All Depts	Action	TBD	TBD
1.1.3	Prepare a five-year capital improvements plan (CIP) to include capital projects that implement the natural, human-caused and technological hazard element of the community's comprehensive plan or projects identified in the Community Mitigation Action Program of this multi-hazard mitigation plan.	All	High	On-Going	All Depts	Action	TBD	TBD
1.2	**Planning Studies. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
1.2.5	Inventory and map existing fire hydrants and piping throughout the city and identify areas in need of new fire hydrants and/or areas of insufficient water pressure for fire suppression.	Wildfires	High	On-Going	Fire Dept Guntersville Water Bd	Action	No Additional Cost	Existing Funds

2020 - 2025 Guntersville Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Depts Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.2.6	Update Wide Hazardous Flow Study, Fixed Site Tier II Reporting Facilities every 3 years.	Technological	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
1.2.7	Assist the Alabama Forestry Commission with their Community Wildfire Plan for Marshall County and its jurisdictions.	Wildfire	Low	Long-Range	FD	Action	No Additional Cost	Existing Funds
1.3	**Zoning and Subdivision Regulations. Establish effective zoning and subdivision controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							
1.3.1	Require/encourage new subdivisions to implement fire reduction measures such as maintaining minimum intervals between structures, providing firebreaks, on-site water storage, wide roads and multiple accesses are measures to reduce fire risks.	Wildfires	High	On-Going	Fire Dept Building Dept	Action	No Additional Cost	Existing Funds
1.4	**Building and Technical Codes. Review local codes for effectiveness of standards to protect buildings and infrastructure from multi-hazard damages.**							
1.4.1	Promote good construction practices and proper code enforcement to mitigate structural failures during disaster events.	Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused	Low	On-Going	Building Dept	Action	No Additional Cost	Existing Funds

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1.4.2	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	Tornadoes Hurricanes Severe Storms Earthquakes	Low	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
1.4.3	Evaluate and revise as appropriate, building codes for roof construction to maximize protection against wind damage from hurricanes, tornadoes, and severe storms; encourage installation of "hurricane clips."	Tornadoes Hurricanes Severe Storms	Low	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
1.4.4	Through local subdivision and land development regulations require the placement of all new utility lines underground for large residential subdivisions and commercial developments.	Tornadoes Severe Storms Winter Storms Hurricanes	Low	On-Going	Building Dept	Action	TBD	TBD
1.4.5	Review fire safety ordinances to ensure they properly regulate open burning.	Wildfires	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
1.4.6	Require the construction of safe rooms within new public buildings, such as new schools, libraries, community centers, and other public buildings by amending applicable ordinances and regulations.	Tornadoes Hurricanes Severe Storms Human-Caused Technological	High	On-Going	Building Dept Fire Dept	Action	No Additional Cost	Existing Funds

2020 - 2025 Guntersville Community Action Program								
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1.5	**<u>Floodplain Management Program.</u> Effectively administer and enforce local floodplain management regulations.**							
1.5.2	Develop guidelines for management of development around flood prone areas and other areas of high flood mitigation values, such as, wetlands, floodplain corridors, upland storage, closed depressional basins and areas of high filtration potential.	Flooding	High	On-Going	Floodplain Manger	Action	No Additional Cost	Existing Funds
1.5.3	Improve flood risk assessment by monitoring flood events and damages, documenting high water marks post event, verification of FEMA's repetitive loss inventory and revising and updating regulatory floodplain maps.	Flooding	Medium	On-Going	Floodplain Manger	Action	No Additional Cost	Existing Funds
1.5.4	Train local floodplain managers through programs offered by the State Floodplain Coordinator and FEMA's training center in Emmitsburg, Maryland.	Flooding	Low	Long-Range	Floodplain Manger	Action	TBD	Existing Funds
1.5.5	Maintain membership for locally designated floodplain managers in the Association of State Floodplain Managers and the Alabama Association Floodplain Managers and encourage active participation.	Flooding	Medium	On-Going	Floodplain Manger	Action	TBD	Existing Funds

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1.5.8	Update local floodplain ordinance for compliance with current NFIP standards.	Flooding	Medium	On-Going	Floodplain Manger	Action	No Additional Cost	Existing Funds
1.5.9	Continue ongoing relations with the State NFIP Coordinator in relation to floodplain management.	Flooding	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
1.6	**Community Rating System Program (CRS). Increase participation of NFIP member communities in the CRS Program.**							
1.6.1	Apply for membership in the CRS Program.	Flooding	Low	On-Going	Floodplain Manger	Action	TBD	Existing Funds
1.10	**Critical Facilities Assessments. Perform assessments of critical facilities (hospitals, schools, fire and police stations, emergency operation centers, special needs housing, and others) to address building and site vulnerabilities to hazards, identify damage control and retrofit measures to reduce vulnerability to damage and disruption of operations during severe weather and other natural and human-caused disaster events.**							
1.10.1	Perform vulnerability assessments of critical facilities to identify retrofit or relocation projects to improve the safety of occupants and mitigate damages from hazards. Included in the assessment should be Fire Station #1 that has been affected by flooding.	All *	High	On-Going	Fire Dept Schools	Action	TBD	TBD

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1.10.2	Conduct wildfire vulnerability assessments of critical facilities and other properties in these risk areas and prepare a comprehensive inventory to identify high and moderate wildfire risk areas.	Wildfire	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
1.10.3	Inspect security measures around critical facilities for areas of concern (i.e., cut away areas in security fencing, inoperable cameras) and develop a plan to address the concerns.	Human-Caused	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
1.10.4	Perform annual penetration and vulnerability assessments of log files and wire data.	Human-Caused	High	On-Going	Schools	Action	TBD	TBD
1.10.5	Encourage water suppliers to assess vulnerability of existing supply systems and share that information with local governments.	Human-Caused	Medium	On-Going	Guntersville Water Bd	Action	TBD	TBD
1.10.6	Establish Threat Assessment Teams on each campus.	Human-Caused			Schools			
1.11	**<u>Geographic Information Systems (GIS) and Information Management</u>. Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories to aid in planning, hazard mitigation and incident reporting.**							

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1.11.3	Maintain a comprehensive inventory of dams and failure inundation areas within the city. If applicable, add to GIS mapping.	Dam Failure	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
1.12	**<u>Dam Safety Management.</u> Establish a comprehensive dam safety program.**							
1.12.1	Support legislation to establish a State dam safety program.	Dam or Levee Failure	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
1.13	**<u>Prescribed Burn Regulations and Wildfire Management Programs.</u> Create regulations and programs to reduce storm debris.**							
1.13.1	Support legislation to enact regulations for the timber industry to conduct prescribed burns after clearing land to lessen the possibility of wildfires.	Wildfires	Medium	On-Going	State Forestry Commission	Action	No Additional Cost	Existing Funds
1.13.2	Encourage programs to conduct prescribed burns of large undeveloped areas of downed trees from disaster events to lessen the possibility of wildfires.	Wildfires	Medium	On-Going	State Forestry Commission	Action	No Additional Cost	Existing Funds
1.14	**<u>Emergency Operations Plan.</u>**							

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1.14.1	Maintain and update emergency operations plans.	All	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
2	**Goal for Human Welfare and Property Protection: Protect people, animals, structures and contents from the damaging effects of hazards.**							
2.6	**Critical Facilities Protection. Protect critical facilities from potential damages and occupants from harm in the event of hazards through retrofits or relocations of existing facilities located in high-risk zones, construction of new facilities, or implementation of security measures for maximum protection from all hazards.**							
2.6.1	Retrofit critical facilities and infrastructure against potential damages from hazards. If a facility cannot be retrofitted, consider relocation of the facility; such as Fire Station #1.	All*	Low	Long Range	Building Dept Fire Dept	Project	TBD	FEMA HMA Grant
2.6.2	Encourage the relocation of existing utility lines underground, where feasible and cost effective.	Tornadoes Severe Storms Winter Storms Hurricanes	Low	Long Range	Building Dept UTIL	Action	No Additional Cost	Existing Funds
2.6.3	Install lightning and/or surge protection on existing critical facilities.	Lightning	Medium	Long Range	Building Dept	Project	TBD	TBD
2.6.4	Require lightning and/or surge protection on new critical facilities.	Lightning	High	Short Range	Building Dept Fire Dept	Project	No Additional Cost	Existing Funds

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2.6.7	Encourage the enhancement of the security of areas surrounding public facilities. Such measures include replacing or removing landscaping that provides cover for attacks, installing motion activated lighting, secure parking lots through fencing and adequate lighting.	Human-Caused	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
2.6.8	Encourage structural changes to secure the buildings, i.e., replace vulnerable doors, install automatic door locks for after hours, install alarms and panic alarms, install CCTVs throughout facilities	Human-Caused	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
2.6.9	Install a public address system throughout public buildings for hazard warnings and shelter-in-place announcements.	Dam FailureTornadoes Hurricanes Severe Storms Human-Caused Technological	High	On-Going	Schools	Project	TBD	TBD
2.6.10	Minimize visitors' access to buildings and provide badges.	Human-Caused	Medium	Long Range	Fire Dept Schools	Action	TBD	TBD
2.6.11	Monitor inflow/outflow of network activity on computer systems in critical facilities to protect against cyberterrorism.	Human-Caused	High	Long Range	Fire Dept City Admin Schools	Action	No Additional Cost	Existing Funds

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2.6.13	Ensure computer firewalls, virus protections, etc. are up-to-date.	Human-Caused	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
2.7	**<u>Back Up Power.</u> Assure uninterrupted power supplies during emergency events.**							
2.7.1	Install or encourage the installation of backup power generators for critical facilities, including radio stations, and fuel stations.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused	High	Long-Range	EMA Schools	Project	TBD	HMGP BRIC
2.7.2	Deploy portable generators to serve as miniature sub-stations to help rapidly restore power to at-risk citizens after a hazard event.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	High	Long-Range	EMA	Project	TBD	TBD
2.8	**<u>Community Shelters and Safe Rooms</u>: Provide shelter from multiple hazards for the safety of community residents.**							

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2.8.1	Work with city leaders in developing standardized procedures for identifying shelters as pre-disaster and post-disaster shelters or safe rooms.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	EMA	Action	No Additional Cost	Existing Funds
2.8.2	Review existing public shelters and safe rooms in public buildings including schools and recommend new locations if and where there are coverage gaps. Include evaluations on ADA compliance and sheltering of animals.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	EMA	Action	No Additional Cost	Existing Funds
2.8.3	Work with the American Red Cross (ARC) in developing "Memorandums of Understanding" (MOUs) with facility owners that serve as shelters.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	City and School	Action	No Additional Cost	Existing Funds

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2.8.4	Determine how to accommodate individuals with special needs both in the emergency operations plan for the shelter or safe room and in the design of the shelter or safe room, including compliance with the American with Disabilities Act (ADA).	Hurricanes Tornadoes Severe Storms Earthquakes	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
2.8.5	Evaluate the need for severe weather plans and shelters in essential facilities and other establishments serving the public (e.g., schools, hospitals, and critical facilities).	Hurricanes Tornadoes Severe Storms Earthquakes Technological	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
2.8.6	Construct new community safe rooms in accessible locations and add safe rooms within new and existing public and institutional buildings, such as schools, colleges and universities, senior centers, community centers, hospitals, and government buildings.	Hurricanes Tornadoes Severe Storms Earthquakes Human-Caused Technological	High	Long Range	Schools	Project	TBD	FEMA HMA Grant

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2.8.8	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes Tornadoes Severe Storms Earthquakes	Medium	On-Going	Fire Dept	Project	No Additional Cost	Existing Funds
2.8.9	Determine which areas at important facilities such as schools and daycare centers are the best locations for occupants during a disaster. Identify and provide directions to the designated “safe place.”	Tornadoes Hurricanes Severe Storms Technological	Medium	On-Going	Fire Dept Building Dept Schools	Action	TBD	Existing Funds
2.8.10	Ensure all public buildings have a refuge plan of where to send people during times of disasters. Encourage posting of the plan in places accessible to the public.	Dam Failure Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	Medium	On-Going	Fire Dept Building Dept Schools	Action	TBD	Existing Funds
2.8.14	Ensure all schools have a place of refuge plan for sporting events held outside and proper posting on where it is located.	Tornadoes Hurricanes Severe Storms Human-Caused Technological	High	Short Range	Schools	Action	No Additional Cost	Existing Funds

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2.9	**Human Welfare.**							
2.9.1	Increase collaboration between government and community organizations regarding containment and response plans for epidemic events involving humans.	Pandemic	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
2.9.2	Continue to support the Area 2 Region Public Health Team in planning and training events such as the Drive-Thru-Flu clinic Exercise, Point of Distribution SNS Exercises and other MMRS activities.	Pandemic	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
2.9.3	Identify and secure resources to build the appropriate medical stockpile of medicines and medical supplies to address sizable epidemics through the MMRS-SNS and Area 2 Public Health Plans	Pandemic	Medium	On-Going	EMA	Action	TBD	TBD
2.9.4	Educate the public about vaccines and immunizations.	Pandemic	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
2.9.5	Require school systems to inform parents/guardians about illness at the schools	Pandemic	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
2.9.6	Ensure school buses include air conditioning when purchasing replacements buses.	Extreme Heat	High	On-Going	Schools	Action	No Additional Cost	Existing Funds

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3	**Goal for Education, Outreach and Awareness. Educate and inform the public, and government and agency staff about the risks of hazards and ways to reduce threats to life and property.**							
3.1	**Community Hazard Mitigation Plan Distribution. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.1.1	Distribute the 2020 plan to local officials, stakeholders, and interested individuals through internet download.	All	High	On-Going	City	Action	No Additional Cost	Existing Funds
3.2	**Technical Assistance. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**							
3.2.1	Provide technical assistance to owners of vulnerable buildings to advise on available building retrofits to protect against hazards damages.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes	Medium	Long Range	Building Dept	Action	No Additional Cost	Existing Funds
3.3	**Flood Map Information. Increase public access to Flood Insurance Rate Map (FIRM) information.**							
3.3.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications, newspaper announcements and other media related outreach events.	Flooding	Medium	On-Going	Building Dept	Action	TBD	FEMA CTP

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3.3.2	Inform builders and property owners about complying with the latest NFIP standards.	Flooding	High	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
3.6	**<u>Outreach Projects.</u> Conduct regular public events to inform the public of hazards and mitigation measures.**							
3.6.5	Develop a fire safety, protection, and prevention outreach program for builders, developers, and the general public.	Wildfire	Medium	On-Going	State Forestry Commission	Action	No Additional Cost	Existing Funds
3.6.6	Develop an educational public awareness campaign informing citizens of land management and landscaping options to limit wildfire spread.	Wildfire	Medium	On-Going	State Forestry Commission	Action	No Additional Cost	Existing Funds
3.6.7	Educate homeowners about the urban – wildland interface and proper plantings and landscaping practices to prevent wildfire destruction.	Wildfire	Medium	On-Going	State Forestry Commission	Action	No Additional Cost	Existing Funds
3.7	**<u>Outreach Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.7.1	Distribute hazard mitigation brochures to students through area schools.	All	Medium	Mid-Range	Schools	Action	No Additional Cost	Existing Funds

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3.7.2	Educate students and the public about the "See Something, Say Something" program, including who to contact about suspicions.	Human-Caused	Medium	Mid-Range	Schools	Action	No Additional Cost	Existing Funds
3.7.5	Provide emergency preparedness information for extreme temperature events through an active educational outreach program with specific plans and procedures for senior citizens and people with special needs.	Extreme Cold Extreme Heat	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.7.7	Educate those in areas without building codes about safer building practices such as the use of fire-resistant materials in construction.	Tornadoes Hurricanes Severe Storms Earthquakes Wildfire	High	On-Going	Fire Dept Building Dept	Action	No Additional Cost	Existing Funds
3.7.9	Educate employees in critical facilities about cybersecurity.	Human-Caused	Medium	On-Going	Schools	Action	No Additional Cost	Existing Funds
3.7.12	Assist the State EMA with notifying the public about dam inundation areas and explaining the risks associated with dam or levee failure in Marshall County and the city.	Dam Failure	Medium	On-Going	EMA	Action	No Additional Cost	Existing Funds

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3.7.13	Educate staff members on proper mitigation measures of pandemic preparedness	Pandemic	High	On-Going	All Dept Schools	Action	No Additional Cost	Existing Funds
3.7.14	Educate staff members for the utilization of virtual resources for virtual and/or remote learning or communications during closures due to pandemics or other hazards.	Pandemic Human-Caused Technological	High	Short-Range	All Dept Schools	Action	No Additional Cost	Existing Funds
3.7.15	Upgrade technology devices for students and teachers for utilization during virtual and/or remote learning.	Pandemic Human-Caused Technological	High	Short-Range	Schools	Project	TBD	TBD
3.8	**Training and Webinars. Attend training and educational webinars on mitigation of national human caused and technological hazard.**							
3.8.4	Enhance and expand training of fire departments in wildfire hazard areas.	Wildfire	High	On-Going	Fire Dept	Action	TBD	TBD
3.8.6	Promote training and attendance by employees at conferences and webinars sponsored by agencies such as FEMA, DHS, APHD, AEMA and the Marshall County EMA.	All	Medium	On-Going	Fire Dept Schools	Action	TBD	TBD

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3.8.7	Encourage completion of the online course FEMA IS-907 on active shooters by employees in critical facilities.	Human-Caused	High	On-Going	Fire Dept Police Dept Schools	Action	No Additional Cost	Existing Funds
3.8.8	Encourage the participation of groups in programs offered by the Department of Homeland Security; such as courses on Targeted Violence and Terrorism Prevention.	Human-Caused	High	On-Going	Fire Dept Police Dept	Action	No Additional Cost	Existing Funds
3.8.11	Expand or participate in expanding traditional disaster exercises involving city and county emergency personnel to include airport and port personnel, infrastructure providers, hospitals, schools, and major employers.	All	High	On-Going	Fire Dept Police Dept	Action	No Additional Cost	Existing Funds
3.9	**<u>Disaster Warning and Notification.</u> Improve public warning and notification systems.**							
3.9.1	Review existing outdoor warning siren coverage and recommend new locations if and where there are coverage gaps. Install new warning sirens in accordance with the plan recommendations.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	High	On-going	EMA	Action	No Additional Cost	Existing Funds

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3.9.2	Upgrade siren-warning systems.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused	High	On-going	EMA	Project	TBD	FEMA HMA Grant
3.9.3	Upgrade critical communications infrastructure.	All	High	On-Going	911	Project	TBD	FEMA HMA Grant
3.9.4	Enter in agreements with surrounding jurisdictions to upgrade communications to the Project 25 Radio system.	All	High	On-Going	911	Action	TBD	FEMA HMA Grant
3.9.5	Create a backup site with communications equipment for 911 services.	All	High	On-Going	911	Project	TBD	FEMA HMA Grant
3.9.6	Develop the capability to re-route communications from one jurisdiction's 911 communication tower to another jurisdiction's in the event of tower failure.	All	High	On-Going	911	Project	TBD	FEMA HMA Grant

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3.9.7	Coordinate with utilities and transportation authorities to improve rapid communications between emergency services and the private sector when basic services might be disrupted during extended periods due to disasters.	All	High	On-Going	911	Action	No Additional Cost	Existing Funds
3.9.9	Evaluate the need for a unified fire advisory system to identify fire risk during extended periods of extreme heat.	Wildfire	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
3.9.11	Explore options for improving the ability of local units of government to report flooding and flash flooding events, receive information, respond, and request assistance.	Flooding	Low	On-Going	EMA	Action	No Additional Cost	Existing Funds
3.9.12	Ensure first responders are aware of any chemicals stored at the school including those used in the science department.	Tornadoes Severe Storms Earthquakes Human-Caused	High	Short Range	Schools	Action	No Additional Cost	Existing Funds
3.10	**<u>Weather Radios</u>. Improve public access to weather alerts.**							

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3.10.1	Continue to promote the purchase and usage of NOAA weather radios in all schools, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries, and the general public, especially in homes with no outdoor warning siren coverage.	Tornadoes Hurricanes Severe Storms Flooding	High	On-Going	Schools	Action	No Additional Cost	Existing Funds
3.10.2	Require/encourage the installation of weather radios in all public buildings and places of public assembly.	Tornadoes Hurricanes Severe Storms Flooding	Medium	On-Going	Building Dept	Action	No Additional Cost	Existing Funds
3.11	**<u>Mass Media Relations and Websites</u>. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, on-line social networking, and government/agency websites to increase public awareness and distribute public information on hazard mitigation topics.**							
3.11.1	Maintain appropriate media relationships to ensure the public is informed of hazard threats and means to mitigate property damages and/or loss of life.	All	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
3.11.2	Increase media coverage of threat and evacuation procedures during peak wildfire times of the year; distribute informational packages in high and moderate wildfire risk areas.	Wildfire	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds

2020 - 2025 Guntersville Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Timeline Short-Range, Mid-Range, Long-Range, On-Going	Lead Depts Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.11.3	Expand the use of city-sponsored websites to disseminate hazard mitigation information.	All	High	On-Going	Fire Dept	Action	No Additional Cost	Existing Funds
3.11.4	Include hazard information on school websites to disseminate hazard mitigation information with a focus on family safety.	All	Low	On-Going	Schools	Action	No Additional Cost	Existing Funds
4	**Goal for Natural Resources Protection. Preserve and restore the beneficial functions of the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.**							
4.3	**Forestry Programs. Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wildfires inside and outside the urban environment.**							
4.3.2	Increase overall green spaces in cities by planting disaster resistant trees with site and location taken into consideration.	Wildfire	Low	On-Going	City Horticulture	Action	TBD	TBD
4.3.3	Develop maintenance programs to clear dead and dry bushes or trees to mitigate wildfires.	Wildfire	Medium	Mid-Range	Street Dept	Action	No Additional Cost	Existing Funds
5	**Goal for Natural System and Infrastructure Improvement and Maintenance Projects. Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where feasible, cost effective, and environmentally suitable.**							

2020 - 2025 Guntersville Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Timeline Short-Range, Mid-Range, Long-Range, On-Going**	**Lead Depts Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
5.1	**<u>Drainage System and Rights-of-Way Maintenance.</u> Improve maintenance programs for streams and drainage ways.**							
5.1.2	Employ prescribed burns of natural debris along streams and in ditches to enhance storm drainage.	Flooding	Low	On-Going	State Forestry Commission	Project	TBD	TBD
5.2	**<u>Reservoirs and Drainage System Improvements.</u> Control flooding through reservoirs and other structural improvements, where deemed cost effective and feasible, such as levees/floodwalls, diversions, channel modifications, dredging, drainage modifications, and storm sewers.**							
5.2.1	Construct drainage improvements to reduce or eliminate localized flooding, including retention and detention ponds.	Flooding	Medium	Long-Range	Engineer	Project	TBD	FEMA HMA Grant

2020 - 2025 Union Grove Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Time Range Short, Mid, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1	**Goal for Prevention. Manage the development of land and buildings to minimize risks of loss due to multiple hazards.**							
1.2	**Planning Studies. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
1.2.3	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	Flooding	Medium	Long-Range	Town Council	Action	TBD	TBD
1.2.4	Identify existing culturally or socially significant structures within participating jurisdictions that have the most potential for losses from disaster events and identify needed structural upgrades.	All*	Medium	Mid-Range	Town Council	Action	No Additional Cost	Existing Funds
1.2.5	Inventory and map existing fire hydrants and piping throughout the town and identify areas in need of new fire hydrants and/or areas of insufficient water pressure for fire suppression.	Wildfires	Medium	Long-Range	VFD	Action	No Additional Cost	Existing Funds
1.2.7	Assist the Alabama Forestry Commission with their Community Wildfire Plan for Marshall County and its jurisdictions.	Wildfire	Low	Long-Range	FD	Action	No Additional Cost	Existing Funds

2020 - 2025 Union Grove Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Time Range Short, Mid, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.3	**<u>Zoning and Subdivision Regulations</u>. Establish effective zoning and subdivision controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							
1.3.6	Enact local ordinances that require community storm shelters within sizeable mobile home parks, apartment complexes, RV parks and other planned communities.	Tornadoes Hurricanes Severe Storms	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
1.4	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from multi-hazard damages.**							
1.4.1	Promote good construction practices and proper code enforcement to mitigate structural failures during disaster events.	Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
1.4.5	Review fire safety ordinances to ensure they properly regulate open burning.	Wildfires	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
1.4.6	Require the construction of safe rooms within new public buildings, such as new schools, libraries, community centers, and other public buildings by amending applicable ordinances and regulations.	Tornadoes Hurricanes Severe Storms Human-Caused Technological	High	On-Going	Town Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Union Grove Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Time Range Short, Mid, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.8	**<u>Open Space Preservation</u>. Minimize disturbances of natural land features and increased storm water runoff through regulations that maintain critical natural features such as open space for drainage, parks, conservation areas, and landscaping.**							
1.8.1	Examine regulatory options and feasibility of requiring open space areas for drainage control, recreation, and landscaping.	Flooding	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
1.9	**<u>Landscape Ordinances.</u> Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff, damage from wind events, mitigate wildfires and improve urban aesthetics.**							
1.9.2	Establish ordinances to help mitigate fire hazards related to fuel buildup due to disasters.	Wildfires	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
1.9.3	Establish ordinances for the planting of new urban forests or replacement of damaged urban forests using disaster resistant tree species to mitigate sediment and erosion control, wind damage and to help beautify and promote healthy urban environments and reduce heating, cooling and storm runoff costs.	Tornadoes Hurricanes Severe Storms	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
1.10	**<u>Critical Facilities Assessments.</u> Perform assessments of critical facilities (hospitals, schools, fire and police stations, emergency operation centers, special needs housing, and others) to address building and site vulnerabilities to hazards, identify damage control and retrofit measures to reduce vulnerability to damage and disruption of operations during severe weather and other natural and human-caused disaster events.**							
1.10.1	Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards.	All *	Medium	On-Going	Town Council	Action	TBD	TBD

2020 - 2025 Union Grove Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Time Range Short, Mid, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.10.4	Perform annual penetration and vulnerability assessments of log files and wire data.	Human-Caused	Medium	On-Going	Town Council	Action	TBD	TBD
1.10.5	Encourage water suppliers to assess vulnerability of existing supply systems and share that information with local governments.	Human-Caused	Medium	On-Going	Town Council	Action	TBD	TBD
1.11	**<u>Geographic Information Systems (GIS) and Information Management</u>. Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories to aid in planning, hazard mitigation and incident reporting.**							
1.11.1	Maintain a hazards and risk assessment database that is accessible to local planners and emergency management personnel, including such data as, flood zones, geohazards, tornado tracks, disaster events and their extents, major drainage structures and a comprehensive inventory of critical facilities, including points of distribution within all jurisdictions. If applicable, add to GIS mapping.	All	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
1.11.3	Mark depths of flooding and storm surge immediately after each event and record the data with GIS mapping if available.	Flooding	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
1.11.4	Provide property assessments of areas impacted by hazards for damage/incident reports. If applicable, add to GIS mapping.	All	Low	On-Going	VFD	Action	TBD	TBD

2020 - 2025 Union Grove Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Time Range Short, Mid, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.11.5	Develop a centralized database of all safe rooms and shelters, both pre-disaster and post-disaster, open to the public for all jurisdictions. Include and update those locations in GIS if applicable.	Tornadoes Hurricanes Severe Storms Earthquakes Technological	Low	On-Going	EMA	Action	No Additional Cost	Existing Funds
1.11.7	Maintain a listing of locations of special needs groups, including the elderly and those with Alzheimer's. Disseminate that information to emergency personnel.	All	Low	On-Going	VFD	Action	No Additional Cost	Existing Funds
1.11.8	Establish a uniform damage reporting procedure for Union Grove to utilize with the Marshall County Emergency Management Agency as the clearinghouse for damage assessment data following disaster events.	All	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
1.12	**<u>Dam Safety Management.</u> Establish a comprehensive dam safety program.**							
1.12.1	Support legislation to establish a State dam safety program.	Dam Failure	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
1.13	**<u>Prescribed Burn Regulations and Wildfire Management Programs.</u> Create regulations and programs to reduce storm debris.**							
1.13.1	Support legislation to enact regulations for the timber industry to conduct prescribed burns after clearing land to lessen the possibility of wildfires.	Wildfires	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Union Grove Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Time Range Short, Mid, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
1.13.2	Encourage programs to conduct prescribed burns of large undeveloped areas of downed trees from disaster events to lessen the possibility of wildfires.	Wildfires	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
1.14	**Emergency Operations Plan.**							
1.14.1	Maintain and update emergency operations plans.	All	Medium	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
2	**Goal for Human Welfare and Property Protection: Protect people, animals, structures and contents from the damaging effects of hazards.**							
2.6	**Critical Facilities Protection. Protect critical facilities from potential damages and occupants from harm in the event of hazards through retrofits or relocations of existing facilities located in high-risk zones, construction of new facilities, or implementation of security measures for maximum protection from all hazards.**							
2.6.1	Retrofit critical facilities and infrastructure against potential damages from hazards.	All*	Low	Long-Range	Town Council	Project	TBD	FEMA HMA Grant
2.6.2	Encourage the relocation of existing utility lines underground, where feasible and cost effective.	Tornadoes Severe Storms Winter Storms Hurricanes	Low	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
2.6.4	Require lightning and/or surge protection on new critical facilities.	Lightning	Low	Long-Range	Town Council	Project	No Additional Cost	Existing Funds

2020 - 2025 Union Grove Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Time Range Short, Mid, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.6.7	Encourage the enhancement of the security of areas surrounding public facilities. Such measures include replacing or removing landscaping that provides cover for attacks, installing motion activated lighting, secure parking lots through fencing and adequate lighting.	Human-Caused	Low	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
2.6.8	Encourage structural changes to secure the buildings, i.e., replace vulnerable doors, install automatic door locks for after hours, install alarms and panic alarms, install CCTVs throughout facilities	Human-Caused	Low	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
2.6.11	Monitor inflow/outflow of network activity on computer systems in critical facilities to protect against cyberterrorism.	Human-Caused	Medium	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
2.7	**<u>Back Up Power.</u> Assure uninterrupted power supplies during emergency events.**							
2.7.1	Install or encourage the installation of backup power generators for critical facilities, including radio stations, and fuel stations.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused	Medium	Long-Range	Town Council	Project	TBD	HMGP BRIC

2020 - 2025 Union Grove Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Time Range Short, Mid, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
2.7.2	Deploy portable generators to serve as miniature sub-stations to help rapidly restore power to at-risk citizens after a hazard event.	Tornadoes Hurricanes Severe Storms Winter Storms Earthquakes Human-Caused Technological	Low	Long-Range	Town Council	Project	TBD	TBD
2.8	**<u>Community Shelters and Safe Rooms</u>: Provide shelter from multiple hazards for the safety of community residents.**							
2.8.1	Work with town leaders in developing standardized procedures for identifying shelters as pre-disaster and post-disaster shelters or safe rooms.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
2.8.2	Review existing public shelters and safe rooms and recommend new locations if and where there are coverage gaps. Include evaluations on ADA compliance and sheltering of animals.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Union Grove Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Time Range Short, Mid, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.8.3	Work with the American Red Cross (ARC) in developing "Memorandums of Understanding" (MOUs) with facility owners that serve as shelters.	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
2.8.4	Determine how to accommodate individuals with special needs both in the emergency operations plan for the shelter or safe room and in the design of the shelter or safe room, including compliance with the American with Disabilities Act (ADA).	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
2.8.5	Evaluate the need for severe weather plans and shelters in essential facilities and other establishments serving the public (e.g., schools, hospitals, and critical facilities).	Hurricanes Tornadoes Severe Storms Earthquakes Technological	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
2.8.6	Construct new community safe rooms in accessible locations and add safe rooms within new and existing public and institutional buildings, such as schools, colleges and universities, senior centers, community centers, hospitals, and government buildings.	Hurricanes Tornadoes Severe Storms Earthquakes Human-Caused Technological	Medium	On-Going	Town Council	Project	TBD	FEMA HMA Grant

2020 - 2025 Union Grove Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Time Range Short, Mid, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.8.7	Establish a program for subsidizing individual and community safe room construction in existing facilities.	Hurricanes Tornadoes Severe Storms Earthquakes	Low	On-Going	Town Council	Project	TBD	FEMA HMA Grant
2.8.8	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes Tornadoes Severe Storms Earthquakes	High	On-Going	Town Council	Project	No Additional Cost	Existing Funds
2.8.9	Determine which areas at important facilities such as schools and daycare centers are the best locations for occupants during a disaster. Identify and provide directions to the designated “safe place.”	Tornadoes Hurricanes Severe Storms Technological	Low	On-Going	VFD	Action	TBD	Existing Funds
2.8.10	Ensure all public buildings have a refuge plan of where to send people during times of disasters. Encourage posting of the plan in places accessible to the public.	Dam Failure Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	Low	On-Going	Town Council	Action	TBD	Existing Funds

2020 - 2025 Union Grove Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed All * - Indicates all hazards except Pandemics	Priority High, Medium, Low	Time Range Short, Mid, Long-Range, On-Going	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.8.11	Establish mutual agreements with other jurisdictions and agencies to help with sheltering of animals during disasters.	Tornadoes Hurricanes Severe Storms	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
2.8.12	Evaluate existing public shelters and safe places for areas for sheltering pets.	Tornadoes Hurricanes Severe Storms	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
2.8.13	Evaluate future plans for public shelters and safe places for sheltering pets.	Tornadoes Hurricanes Severe Storms	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
2.9	**Human Welfare.**							
2.9.1	Increase collaboration between government and community organizations regarding containment and response plans for epidemic events involving humans.	Pandemic	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3	**Goal for Education, Outreach and Awareness. Educate and inform the public, and government and agency staff about the risks of hazards and ways to reduce threats to life and property.**							
3.1	**Community Hazard Mitigation Plan Distribution. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.1.1	Distribute the 2020 plan to local officials, stakeholders, and interested individuals through internet download.	All	High	On-Going	Town Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Union Grove Community Action Program								
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3.2	**<u>Technical Assistance</u>. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**							
3.2.1	Provide technical assistance to owners of vulnerable buildings to advise on available building retrofits to protect against hazards damages.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.5	**<u>Publication Distribution.</u> Use local library resources and other agencies/departments to educate the public on hazard risks and mitigation alternatives through distribution of publications on hazards and hazard mitigation.**							
3.5.2	Distribute FEMA Publication 320 - Taking Shelter from the Storm: Building a Safe Room in Your House - through building permit and inspection offices.	Tornadoes Hurricanes Severe Storms Earthquakes	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.5.3	Distribute outreach materials to citizens, builders and business owners inquiring about flood problems or other flood related questions.	Flooding	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.5.4	Implement and distribute “Drought Dos and Don’ts” to the general public.	Drought	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Union Grove Community Action Program								
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3.5.6	Promote technical information from agencies such as the Insurance Institute for Business and Home Safety and Federal Alliance for Safe Homes.	Tornadoes Hurricanes Severe Storms Earthquakes	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.5.7	Provide emergency preparedness information and resources for the protection and care of animals during extended periods of extreme heat or cold.	Extreme Heat Extreme Cold	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.5.8	Provide outreach materials regarding the appropriate actions to take in the event of a hazardous material release.	Human-Caused	Low	On-Going	VFD	Action	No Additional Cost	Existing Funds
3.6	**<u>Outreach Projects.</u> Conduct regular public events to inform the public of hazards and mitigation measures.**							
3.6.1	Continue to participate in environmental awareness events to provide the public information on hazard exposure and mitigation measures, such as City/County Day, Hurricane Awareness Week, and severe Weather Week.	All	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Union Grove Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Time Range Short, Mid, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.6.2	Distribute material via the internet and other media, and other outreach activities and workshops to encourage families and individuals to implement hazard mitigation measures in their homes.	All	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.6.4	Promote awareness of human-caused and technological hazards through workshops, educational materials and planning guides to businesses and the general public.	Human-Caused Technological	Low	On-Going	Town Council	Action	TBD	Existing Funds
3.6.5	Develop a fire safety, protection, and prevention outreach program for builders, developers, and the general public.	Wildfire	Low	On-Going	VFD	Action	No Additional Cost	Existing Funds
3.6.7	Educate homeowners about the urban – wildland interface and proper plantings and landscaping practices to prevent wildfire destruction.	Wildfire	Low	On-Going	VFD	Action	No Additional Cost	Existing Funds
3.7	**<u>Outreach Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.7.2	Educate students and the public about the "See Something, Say Something" program, including who to contact about suspicions.	Human-Caused	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.7.3	Promote the education of citizens on water saving techniques through the local water boards and area schools.	Drought	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Union Grove Community Action Program								
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3.7.5	Provide emergency preparedness information for extreme temperature events through an active educational outreach program with specific plans and procedures for senior citizens and people with special needs.	Extreme Cold Extreme Heat	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.7.6	Educate homeowners about structural and non-structural retrofitting of homes vulnerable to certain hazards.	Tornadoes Hurricanes Severe Storms Earthquakes Flooding	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.7.8	Educate the citizens about proper procedures for sheltering in place.	Tornadoes Hurricanes Severe Storms Earthquakes Human-Caused Technological	Low	On-Going	VFD	Action	No Additional Cost	Existing Funds
3.7.10	Enhance public safety through awareness and outreach materials to the public with regards to pandemics.	Pandemic	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds

2020 - 2025 Union Grove Community Action Program								
	Goal, Objectives and Mitigation Measures	**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Time Range Short, Mid, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.7.11	Educate the public about existing flood warning systems such as Everbridge	Flooding	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.7.12	Assist the State EMA with notifying the public about dam inundation areas and explaining the risks associated with dam or levee failure in Marshall County that impacts Union Grove.	Dam Failure	Low	Long-Range	Town Council	Action	No Additional Cost	Existing Funds
3.8	**<u>Training and Webinars.</u> Attend training and educational webinars on mitigation of national human caused and technological hazard.**							
3.8.1	Train additional weather spotters.	Tornadoes Severe Storms Flooding Hurricanes	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.8.3	Organize local veterinarians to educate the public and emergency personnel through workshops on the handling of pets, livestock, and wild animals during disasters .	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Low	Long-Range	EMA	Action	No Additional Cost	Existing Funds
3.8.4	Enhance and expand training of fire departments in wildfire hazard areas.	Wildfire	Low	On-Going	VFD	Action	TBD	TBD

2020 - 2025 Union Grove Community Action Program								
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3.8.6	Promote training and attendance by employees at conferences and webinars sponsored by agencies such as FEMA, DHS, APHD, AEMA and the Marshall County EMA.	All	Low	On-Going	Town Council	Action	TBD	TBD
3.8.7	Encourage completion of the online course FEMA IS-907 on active shooters by employees in critical facilities.	Human-Caused	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.8.11	Expand or participate in expanding traditional disaster exercises involving town and county emergency personnel to include airport and port personnel, infrastructure providers, hospitals, schools, and major employers.	All	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.9	**<u>Disaster Warning and Notification.</u> Improve public warning and notification systems.**							
3.9.1	Review existing outdoor warning siren coverage and recommend new locations if and where there are coverage gaps. Install new warning sirens in accordance with the plan recommendations.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Medium	On-Going	Town Council	Project	TBD	FEMA HMA Grant

2020 - 2025 Union Grove Community Action Program								
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3.9.2	Upgrade siren-warning systems.	Flooding Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused	Medium	On-Going	Town Council	Project	TBD	FEMA HMA Grant
3.9.3	Upgrade critical communications infrastructure.	All	Medium	On-Going	Town Council	Project	TBD	FEMA HMA Grant
3.9.4	Enter in agreements with surrounding jurisdictions to upgrade communications to the Project 25 Radio system.	All	Medium	On-Going	Town Council	Action	TBD	FEMA HMA Grant
3.9.8	Establish procedures to warn facilities storing hazardous materials when a hazard event is likely to impact the facility to ensure safety procedures are enacted.	Tornadoes Hurricanes Severe Storms Earthquakes Dam Failure Human-Caused Technological	Low	On-Going	VFD	Action	No Additional Cost	Existing Funds

2020 - 2025 Union Grove Community Action Program								
Goal, Objectives and Mitigation Measures		**Hazards Addressed All * - Indicates all hazards except Pandemics**	**Priority High, Medium, Low**	**Time Range Short, Mid, Long-Range, On-Going**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
3.9.10	Participate in the "Turn Around Don't Drown" program by purchasing and installing signs in known flash flood locations.	Flooding	Medium	On-Going	Town Council	Project	No Additional Cost	Existing Funds
3.10	**<u>Weather Radios</u>. Improve public access to weather alerts.**							
3.10.1	Continue to promote the purchase and usage of NOAA weather radios in all schools, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries, and the general public, especially in homes with no outdoor warning siren coverage.	Tornadoes Hurricanes Severe Storms Flooding	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.10.2	Require/encourage the installation of weather radios in all public buildings and places of public assembly.	Tornadoes Hurricanes Severe Storms Flooding	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.10.3	Distribute weather radios and emergency response instructions to municipal residents and businesses.	Tornadoes Hurricanes Severe Storms Flooding	Medium	On-Going	Town Council	Action	TBD	FEMA HMA Grant

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3.10.4	Promote the use of weather radios in households and businesses.	Tornadoes Hurricanes Severe Storms Flooding	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.11	**<u>Mass Media Relations and Websites</u>. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, on-line social networking, and government/agency websites to increase public awareness and distribute public information on hazard mitigation topics.**							
3.11.1	Maintain appropriate media relationships to ensure the public is informed of hazard threats and means to mitigate property damages and/or loss of life.	All	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.11.2	Increase media coverage of threat and evacuation procedures during peak wildfire times of the year; distribute informational packages in high and moderate wildfire risk areas.	Wildfire	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
3.11.3	Expand the use of town-sponsored websites to disseminate hazard mitigation information.	All	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
4	**<u>Goal for Natural Resources Protection</u>. Preserve and restore the beneficial functions of the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.**							

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4.3	**<u>Forestry Programs.</u> Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wildfires inside and outside the urban environment.**							
4.3.1	Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).	Flooding	Low	On-Going	Town Council	Action	No Additional Cost	Existing Funds
4.3.2	Increase overall green spaces in cities by planting disaster resistant trees with site and location taken into consideration.	Wildfire	Low	On-Going	Town Council	Action	TBD	TBD
4.3.3	Develop maintenance programs to clear dead and dry bushes or trees to mitigate wildfires.	Wildfire	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
4.3.5	Encourage Volunteer Fire Departments to improve capabilities for responding to and extinguishing wildfires.	Wildfires	Medium	On-Going	VFD	Action	No Additional Cost	Existing Funds
4.4	**<u>Water Resources Conservation Programs.</u> Protect water quantity and quality through water conservation programs to mitigate the effects of droughts and assure uninterrupted potable water supplies.**							
4.4.1	Encourage water conservation through public outreach programs prior to a drought event.	Drought	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
4.4.2	Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.	Drought	Medium	On-Going	Town Council	Project	TBD	FEMA HMA Grant

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4.4.3	Provide advice to jurisdictions on potential new sources of water during extreme drought.	Drought	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
4.4.4	Encourage the implementation of programs by utilities for water metering and leak detection programs.	Drought	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds
5	**Goal for Natural System and Infrastructure Improvement and Maintenance Projects. Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where feasible, cost effective, and environmentally suitable.**							
5.1	**Drainage System and Rights-of-Way Maintenance. Improve maintenance programs for streams and drainage ways.**							
5.1.4	Collaborate with ALDOT in addressing drainage issues along state roadways.	Flooding	Medium	On-Going	Town Council	Action	No Additional Cost	Existing Funds