2014

Tuscaloosa County, Alabama

Multi-Hazard Mitigation Plan

I. Comprehensive Plan

A multi-jurisdiction plan

Prepared under the direction of the
Tuscaloosa County Hazard Mitigation Planning Committee

With the support of the Tuscaloosa County EMA by:

Lehe Planning LLC
URBAN AND ENVIRONMENTAL PLANNING

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February 25, 2015

2014 Tuscaloosa County, Alabama, Multi-Hazard Mitigation Plan

I. Comprehensive Plan

Town of Brookwood, Town of Coaling, Town of Coker, Town of Lake View, City of Northport, City of Tuscaloosa, Town of Vance, and Tuscaloosa County

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I. Background

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. FEMA has implemented the various hazard mitigation planning provisions through regulations in 44 CFR Part 201, which also permits human-caused and technological hazards (man-made) 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 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. The initial 2004 plan was approved by FEMA upon its adoption by the Tuscaloosa County Commission, and the 2009 plan update was approved by FEMA on October 7, 2009.

II. Organization of the Plan

The 2014 Tuscaloosa County Multi-Hazard Mitigation Plan is organized to parallel the 44 CFR Section 201.6 Federal requirements for a local mitigation plan, as interpreted by Local Mitigation Planning Handbook, FEMA, March 2013. The organization of this plan is consistent with the organization of the 2013 Alabama State Hazard Mitigation Plan, which also parallels the Federal requirements. The plan has three parts, as follows:

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This plan update is also organized similarly to the 2004 Tuscaloosa County Hazard Mitigation Plan and the 2009 Tuscaloosa County Hazard Mitigation Plan, which allows for easy cross reference. Each chapter of the 2014 plan update references the requirements of 44 CFR Section 201.6 that it addresses and includes a table that summarizes the updates to the 2009 plan.

III. Highlights of the Plan

Through a comprehensive planning process and risk assessment, this plan update continues a unified approach among all Tuscaloosa County communities for dealing with identified hazards and associated risk issues. It serves as a guide for local governments in their ongoing efforts to reduce community vulnerabilities. It also evaluates the 2009 plan: notes its successes and shortcomings, suggests adjustments, and introduces new measures to address the various hazards.

Each hazard, natural and human-caused, that is viewed as a possible risk to Tuscaloosa County is described in detail; the vulnerability of the County and each jurisdiction to the hazards are addressed; goals, objectives, and mitigation strategies and actions are stated; and mitigation plans that direct each jurisdiction in the implementation and monitoring of the measures are included in the update.

Chapter 1. Introduction

Chapter 1 of the plan update provides a general introduction to the plan update. It explains the purpose of the plan and which jurisdictions participated in the plan update. The chapter mentions the regulations that require the active participation by local jurisdictions in the mitigation planning process. Also included in this chapter is the explanation of various funding sources that can be applied for if a plan update is submitted to FEMA. Summaries of the planning processes from the 2004 and 2009 plan and this update's planning process are also described in this section.

Chapter 2. Prerequisites

Chapter 2 of the plan update addresses the regulations governing the development and updating of the mitigation plan. It addresses 44 CFR Secs. 201.6 and the prerequisites required through these regulations. It goes into greater detail about the various mitigation grants and other federal money available for the County's use for mitigation planning and projects.

Chapter 2 also addresses multi-jurisdictional participation and plan adoption. It describes the relationship and responsibilities of the various entities involved in the planning process. It explains the various means in which they could participate in the planning process. The multi-jurisdictional plan adoption procedure is explained in the last section of the chapter.

Chapter 3. Community Profiles

Chapter 3 profiles the participating jurisdictions. Each jurisdiction within Tuscaloosa County is described in detail. The overall geographic setting and history of Tuscaloosa County and the participating jurisdictions are addressed. Summaries about the jurisdictions' government, demographics, economy, utilities, media, transportation and climate are included.

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Chapter 4. The Planning Process

Chapter 4 explains the planning process in detail. It explains how the public was involved in the planning process, what steps the Hazard Mitigation Planning Committee (HMPC) took in developing the plan update, what documents were consulted in the plan update, and how the plan was prepared, reviewed and updated.

In April 2014, a kick off meeting was held to reactivate the HMPC and prepare for the upcoming five year plan update. The Tuscaloosa County Hazard Mitigation Planning Committee (HMPC), comprised of representatives from all the jurisdictions and organizations concerned with hazard mitigation, guided the development of this plan.

During the plan drafting process, the Hazard Mitigation Planning Committee held five meetings between April 17 and October 16, 2014. Each Committee member was asked to participate in a series of exercises designed to solicit input into the planning process. A notice and survey 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.

The participating jurisdictions provided copies of their plans, studies, reports, ordinances, regulations and technical information to the planning team in 2009, but no significant changes had been made to these documents since then. The planning team had previously reviewed the documents and recorded the sections from each document that pertained to hazard mitigation. These documents were considered to see what mitigation measures were currently being pursued and what new measure could be included in future revisions.

The Hazard Mitigation Planning Committee solicited public input into the mitigation plan through a public survey, public meetings, the local news media, and a website at Tuscaloosa.hazardmitigationplan.com. They were also invited to attend committee meetings and provide their comments and concerns. The plan on the website was continually updated and available for public review and comment throughout the planning process. The public was further encouraged to participate via Twitter and Facebook or to email their comments to tuscaloosa@hazardmitigationplan.com . The Tuscaloosa County EMA made a number of attempts to get participation by the media, public and area agencies through emails once the draft plan was complete. On September 11, 2014, hundreds attended Tuscaloosa's very popular annual "Be Ready Day" at the site of the Old Fire College on McFarland Boulevard East in Tuscaloosa. The 2014 event included an open house in the auditorium of the Old Fire College
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A public hearing to receive comments was held by each jurisdiction prior to adopting this plan by resolution, as required by State law. The original resolutions and public hearing minutes are kept on file at the EMA offices.

The plan review and update process resulted in a comprehensive update of the entire 2009 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.
- A detailed assessment of local capabilities to carry out mitigation measures.
- An evaluation of the status and effectiveness of mitigation measures adopted in the 2009 plan, which was reflected in the 2014 Community Action Programs for each jurisdiction.
- A reassessment of risks to include detailed research and analysis of hazards affecting the communities, as well as adding man-made hazards to the Risk Assessment.
- A thorough update of critical facilities and assessment of vulnerabilities.
- A complete 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; modifications to the 2009 goals; and support of the 2013 State goals for hazard mitigation,
- Identification and analysis of a comprehensive range of mitigation alternatives.
- A reprioritization of mitigation actions and projects.
- Revised mitigation action programs for each jurisdiction to better reflect the results of the plan update.
- Review of the plan maintenance.

Chapter 5. Risk Assessment

Chapter 5 first describes the process used to identify and prioritize the hazard risks to each Tuscaloosa County jurisdiction. It describes the resources used to identify the hazards and provides detailed descriptions of each identified hazard. A hazard profile for each identified hazard includes a general description of the nature of the hazard in Tuscaloosa County, followed by an explanation of the location, extents, previous occurrences, and the probabilities of future occurrences. The hazard profiles rely heavily on maps, charts, tables, and figures to communicate the profile information. The Federal requirements for repetitive loss properties are included in this chapter.

Vulnerability assessments are reported for each identified hazard. The vulnerability assessments include a summary of the impacts of each hazard on each jurisdiction. Next, vulnerability assessments of structures are reported. Detailed inventories of buildings, infrastructure, and critical facilities are presented and often mapped. The HAZUS-MH data bases are supplemented by local information. The estimates of losses are calculated in HAZUS-MH for earthquakes, hurricanes, and floods, and methods are presented for loss estimate calculations of the other identified hazards. A fresh look at land and development trends since the 2009 plan reveals the concerns for reducing exposure for developing areas of Tuscaloosa County.

Chapter 5 concludes with an analysis of how the risks vary among the jurisdictions. This concluding section summarizes the findings of the hazard profiles and vulnerability assessments.

A complete reevaluation of the hazards was performed by the planning team in the plan update process. Hazard profiles and vulnerability assessments were based on current and more complete information since the 2004 plan. The latest release of HAZUS-MH was applied to the risk assessments, and the updated HAZUS-MH database provided much of the information required to evaluate the vulnerability of structures and perform loss estimates.

Chapter 6. Mitigation Strategy

Chapter 6 addresses the full range of mitigation strategies evaluated by the HMPC. It explains the common community vision for disaster resistance and the goals that the plan is trying to achieve, along with objectives that can be used to achieve those goals. It identifies and analyzes mitigation actions and projects. A description of participation and compliance with the National Flood Insurance Program is provided. Mitigation actions implementation is discussed. This forms the basis for the Community Action Programs for each jurisdiction.

New goals have been developed, based on current conditions, the completion of mitigation measures over the five-year plan implementation cycle, the 2014 update to the risk assessment in Chapter 5, the update to the risk assessment in the 2013 Alabama Hazard Mitigation Plan, and the update of State goals and mitigation priorities reflected in the state plan.

The goals for this plan update are, as follows:

- **Prevention Goal.** Manage the development of land and buildings to minimize risks of loss due to natural and man-made hazards.

- **Property Protection Goal.** Protect structures and their occupants and contents from the damaging effects of natural and man-made hazards.

- **Public Education and Awareness Goal.** Educate and inform the public about the risks of hazards and the techniques available to reduce threats to life and property.

- **Natural Resources Protection Goal.** 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.

- **Structural Projects Goal.** Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where found to be feasible, cost effective, and environmentally suitable.

This strategic planning approach for identifying and analyzing mitigation actions and projects follows five categories of a comprehensive hazard mitigation program, which also form the basis for the goals of this plan. These program categories were developed by FEMA for managing a successful mitigation program and were used as guidelines for identifying and sorting the alternative mitigation measures. They are prevention, property protection, public education and awareness, natural resources protection, and structural projects. Emergency services was discarded as a mitigation goal, with related emergency services measures incorporated into one of the five other goals.

The Hazard Mitigation Planning Committee (HMPC) and local jurisdictions selected among the available mitigation measures within each of the above categories and prioritized the measures by applying the STAPLEE method. They also evaluated the consistency with the vision, goals, and objectives; weight of benefit to cost; FEMA and State funding priorities for Hazard Mitigation Assistance grants; and the planning, regulatory, fiscal, and staffing capacities of the jurisdictions for carrying out the measures. The April 2011 tornadoes greatly influenced the prioritization of mitigation measures. Mitigation measures that resulted in loss reduction to existing and new buildings and infrastructure were chosen for the final list of considered measures. Each jurisdiction assigned a priority to selected measures, established a general completion schedule, assigned administrative responsibility for carrying out the measures, estimated costs, where possible, and identified potential funding sources, including potential eligibility for FEMA Hazard Mitigation Assistance Programs.

A separate Community Action Program has been established for each community and published as a separate volume. The proposed measures are within the authority of the jurisdiction or are part of a joint effort among multiple jurisdictions covered by this plan. All actions included in these programs are achievable and within the capabilities of each jurisdictions.

Chapter 7. Plan Maintenance Process

Chapter 7 describes the maintenance process for the 2014 Tuscaloosa County Multi-Hazard Mitigation Plan. It explains the monitoring, evaluation and updating procedures and how to incorporate the plan into other planning mechanisms. It also describes the need for continuing public participation in the plan maintenance process.

The plan explains that ongoing monitoring of the plan should occur throughout the next five years until the next scheduled update. Ongoing status reports of each jurisdiction's progress will be reviewed by the EMA Director and representatives from the HMPC and should include the following information:

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

The ongoing review process may require adjustments to the selection of mitigation measures, priorities, timelines, lead responsibilities, and funding sources.

Plan evaluation should occur within sixty days following a significant disaster or an emergency event having a substantial impact on a portion of or the entire Tuscaloosa County area or any of its jurisdictions. A risk assessment should be done and the findings should determine any new mitigation initiatives that should be incorporated into this plan to avoid similar losses from future hazard events.

The HMPC will oversee an annual evaluation of progress towards implementation of the Mitigation Strategy. In its annual review, the HMPC will 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 the plan?
- Have any disasters occurred and are not included in plan?
- Are there additional mitigation ideas that need to be incorporated into the 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?

Any updates, revisions, or amendments to the Tuscaloosa 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. As part of 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. Multi-hazard mitigation planning should be integrated into existing public information activities, as well as household emergency preparedness.

Ongoing public education programs should stress the importance of managing and mitigating hazard risks. Consequently, the Hazard Mitigation Planning Committee is dedicated to direct involvement of its citizens in providing feedback and comments on the plan throughout the five-year implementation cycle and interim reviews.

Public meetings will be held when significant modifications to the plan are required or when otherwise deemed necessary by the Hazard Mitigation Planning Committee. The public will be able to express their concerns, ideas, and opinions at the meetings. At a minimum, public hearings will be held during the annual and five-year plan updates and to present the final plan and amendments to the plan to the public before adoption.

Appendices

The final sections of the plan are the Appendices. The supporting documents for this plan update that were able to be included in this plan update have been inserted into the following appendices:

A *Federal Requirements for Local Mitigation Plans* contains the entire 44 CFR Sec. 201.6 requirements for local mitigation plans.

B *Community Mitigation Capabilities* reports on the results of a comprehensive survey and assessment of each jurisdiction's capabilities to implement mitigation measures.

C *2009 Plan Implementation Status* reports the evaluation results of implementation of mitigation measures recommended for implementation by each jurisdiction in the 2004 plan.

D *Hazard Ratings and Descriptions* reports the results of the Committee exercise for identifying hazards for inclusion in the 2014 plan update and the ratings of the hazards for extents and probability of future occurrences. A complete description of each identified hazard is included here.

E *Hazard Profile Data* contains detailed hazard records of the National Weather Service, the National Climatic Data Center, and local newspapers.

F *Alternative Mitigation Measures* examines the range of mitigation measures considered for the 2014 Mitigation Strategy in Chapter 6 and the Community Action Programs in Volume II.

G *Committee Meeting Documentation* documents the HMPC meetings during the drafting phase of the 2014 plan update.

H *Community Involvement Documentation* reports on the full scope of community involvement opportunities during the drafting phase of the 2014 plan update.

I *Multi-Jurisdictional Participation Activities* records the scope of participation of all jurisdictions in the drafting and adoption of the 2014 plan update.

J *Adopting Resolution* presents a model resolution for plan adoption by local governing bodies.

Other documents and materials mentioned in the plan or used in its preparation but not included in the plan appendices are kept on file in the Tuscaloosa County EMA office. These other documents and materials, include, but are not limited to the following items:

- Local newspaper articles reporting hazard events since 1960;
- 2014 HAZUS-MH global reports for earthquakes, hurricanes, and floods;
- Damage reports of hazard events;
- Meeting records of the Hazard Mitigation Planning Committee prior to 2014, since first established in 2004; and
- Documentation in support of the 2004, 2009, and 2014 plans.

Chapter 1 – Introduction

1.1 Background

The 2014 Tuscaloosa County Multi-Hazard Mitigation Plan is a multi-jurisdictional, multi-hazard mitigation plan. This 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. This plan covers the entire county including all unincorporated areas, the Towns of Brookwood, Coaling, Coker, Lake View, Vance and the Cities of Northport and Tuscaloosa.

The Tuscaloosa County and City School Boards have also participated in and adopted this 2014 plan update as both stakeholders and local governments. They adopted the plan to demonstrate their endorsement and active participation in the planning process. They are not treated in the plan as unique geographic areas, nevertheless have been included in the risk assessments and action programs of other jurisdictions. The Tuscaloosa County School Board facilities are covered by the risk and vulnerability assessments in Chapter 5 “Risk Assessment” and the “Community Action Programs” for unincorporated Tuscaloosa County and the municipal jurisdictions in which each of its facilities is located. Likewise, the Tuscaloosa City School Board facilities have been included as part of the City of Tuscaloosa.

The University of Alabama and the rural fire districts and volunteer fire departments, represented through the Tuscaloosa County Fire Association, were additional local participants in the 2014 planning process. The University of Alabama has been included as part of the City of Tuscaloosa, and the rural fire districts and volunteer fire departments have been included as part of Tuscaloosa County.

The towns of Moundville and Woodstock, which are only partially located in Tuscaloosa County, have chosen not to participate in this 2014 plan update. Instead, these towns intend to actively participate in the plans of the counties in which they are primarily situated. Moundville is primarily situated in Hale County, with just a small portion located in Tuscaloosa County, and similarly, Woodstock is primarily located in Bibb County.

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.

FEMA has implemented the various hazard mitigation planning provisions through regulations in 44 CFR Part 201, which also permit man-made 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 must 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 Tuscaloosa County EMA applied to the Alabama EMA for planning grant funds in 2013 to complete the 2014 update of this plan. In late 2013, the Alabama EMA awarded a $20,625 planning grant funded through the FEMA Hazard Mitigation Grant Program (HMGP) to the Tuscaloosa County Commission to fund a portion of the $29,000 total cost of the five year plan update for all incorporated and unincorporated areas within Tuscaloosa County. The Tuscaloosa County Commission provided the $8,375 balance in cash.

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. These FEMA grants include the following programs:

1. The Hazard Mitigation Grant Program (HMGP). The 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. Funding becomes following a Presidential major disaster declaration in the areas of the State requested by the Governor. The amount of HMGP funding available 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. Following the 2011 tornado outbreak, approximately $70 million became available statewide.

2. <u>The Pre-Disaster Mitigation Grant Program (PDM).</u> The PDM program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds. For FY 2013, $23.7 million in PDM funding was available nationwide.

3. <u>The Flood Mitigation Assistance Program (FMA).</u> The FMA program 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 (NFIP). For FY 2013, $120 million in FMA funding was available nationwide. Two types of FMA grants are available to communities:

   - *Planning Grants* to prepare 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.

4. The Public Assistance Grant Program (Categories C – G) (PA). The Public Assistance Grant Program 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 publicly 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.

5. The Fire Management Assistance Grant Program (FMAGP). Fire Management Assistance Grant Program 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 FMAGP 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 Tuscaloosa County Hazard Mitigation Plan (2005)

The initial Tuscaloosa County Hazard Mitigation Plan (2005) was approved by FEMA in 2005 and was prepared by the West Alabama Regional Planning Commission under the direction of the Hazard Mitigation Planning Committee, the Local Emergency Planning Committee, and the Tuscaloosa County EMA. It includes all incorporated and unincorporated areas of Tuscaloosa County and addresses all natural hazards. The 2005 plan was the first coordinated effort in Tuscaloosa County to assess risks and develop mitigation strategies to respond to those risks.

1.6 Tuscaloosa County Hazard Mitigation Plan 2009 Plan Update

The first plan update process began in July of 2007 after the Alabama EMA awarded the Alabama Association of Regional Councils (AARC) a planning grant. In turn, funds were passed through to the West Alabama Regional Commission to pay 75% of the plan update costs. The remaining 25 percent was provided locally through in-kind services and member dues. Again, the West Alabama Regional Commission planners worked under the direction of the Tuscaloosa County EMA Director, the Hazard Mitigation Planning Committee, and the Local Emergency Planning Committee. The 2009 plan includes all incorporated and unincorporated areas of Tuscaloosa County and adds manmade hazards to the natural hazards addressed in the 2005 plan. Despite their primary location in adjoining counties, the towns of Moundville and Woodstock participated in the 2009 plan update for Tuscaloosa County and were also included in the Hale and Bibb County plans. The 2009 plan was adopted by all municipalities, the Tuscaloosa County School Board, the University of Alabama, the Tuscaloosa County Fire Association, and the West Alabama Regional Commission. FEMA approved the plan on October 7, 2009.

1.7 The 2014 Tuscaloosa County Multi-Hazard Mitigation Plan Update

The Tuscaloosa County Hazard Mitigation Planning Committee (HMPC) was reactivated five years later in April of 2014 to update the 2009 plan as the 2014 Tuscaloosa County Multi-Hazard Mitigation Plan. The Tuscaloosa County Commission retained Lehe Planning, LLC, to prepare the updated plan under the direction of the HMPC and the Tuscaloosa County EMA Director, David Hartin. The firm's manager, James E. Lehe, AICP, a professional urban planner, served as the Planning Coordinator for the update. The 2014 HMPC represented unincorporated Tuscaloosa County; the cities of Northport and Tuscaloosa; the Towns of Brookwood, Coaling, Coker, Lake View, and Vance; the City of Tuscaloosa School Board, Tuscaloosa County School Board, the University of Alabama, and the Tuscaloosa County Fire Association. The HMPC convened five meetings to oversee the drafting of the plan update and hosted a community event to inform the public of the plan findings and recommendations and solicit public comments. The 2014 planning process continued the unified approach among all Tuscaloosa County communities and continues to guide Tuscaloosa County communities in their ongoing efforts to mitigate vulnerabilities.

Chapter 2 – Prerequisites

2.1 Federal Prerequisites

This chapter of the Plan 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 initial step towards continuing 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 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 (FMAGP). Once the plan is approved pending adoption, the governing bodies of the participating jurisdictions and school districts must formally adopt the plan and submit their adopting resolutions to FEMA through the Alabama EMA to receive official FEMA approval. This process must take place within twelve months of FEMA's notification of conditional approval pending adoption. If the plan is not approved by FEMA and locally adopted by resolution of the governing body, the jurisdiction or school board will not be eligible to apply for and receive project grants under any of the FEMA hazard mitigation assistance programs. Hazard mitigation assistance programs have additional requirements for grant eligibility depending on the program's funding source.

2.3 Multi-Jurisdictional Participation

The Tuscaloosa County EMA serves as the lead coordinating agency for mitigation planning. It has been working in conjunction with the Hazard Mitigation Planning Committee (HMPC) and has remained in contact and coordinated mitigation activities with all Tuscaloosa County jurisdictions throughout the five year period since the 2005 plan was first approved. Tuscaloosa County; the towns of Brookwood, Coaling, Coker, Lake View, and Vance; the cities of Northport and Tuscaloosa; the City of Tuscaloosa School Board, the Tuscaloosa County School Board, the University of Alabama, and the Tuscaloosa County Fire Association all have continued to participate in the 2014 plan update of the existing plan. The towns of Moundville and Woodstock, which are primarily located in adjoining counties, have likewise participated in this 2014 plan update. 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).

School districts are defined as local governments, according to Federal regulations at 44 CFR Section 201.2, and are therefore required to have a FEMA-approved local mitigation plan to be eligible for project grants under FEMA hazard mitigation assistance programs. A school district may also 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 City of Tuscaloosa and the Tuscaloosa County School Boards Education actively participated in and adopted the 2014 plan.

The planning process presented many opportunities for multi-jurisdictional participation. (See Appendix I "Multi-Jurisdictional Participation Activities," which shows the type of participation by Tuscaloosa County jurisdictions.) These multi-jurisdictional participation opportunities included the following activities:

- Attendance and participation in four HMPC committee meetings beginning on April 17, 2014, during the drafting phase of the plan (see Appendix G "Committee Meeting Documentation," which includes agendas, sign-in sheets, and meeting minutes).

- Providing key staff support to complete HMPC exercises and questionnaires regarding local capabilities for conducting mitigation activities, the implementation status of the 2009 mitigation actions, identifying and rating hazards, profiling hazards and hazard events, evaluating alternative mitigation measures, and updating plan goals and objectives.
- Reviewing and providing comments on draft plan sections.
- Compiling plans, studies, reports, regulations, ordinances, and codes related to hazard mitigation and making these documents available to planners for review.
- Conferring with planners during the drafting phase of the plan update.
- Providing information to the HMPC and planners on critical facilities and infrastructure.
- Attendance and participation in the Community Meeting held following the final HMPC committee meeting, at the end of the drafting phase of the plan update.
- Communicating with elected officials and other jurisdictional constituents on the scope and contents of the draft plan update.
- Conducting public hearings, which offered additional opportunities for public comments prior to formal adoption by the governing bodies.

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

- Attending publicly announced HMPC meetings as observers of these open public forums.
- Participating in the Community Meeting.
- Completing Public Questionnaires distributed at the Community Meeting.
- Accessing the plan update website at http://tuscaloosa.hazardmitigationplan.com to keep abreast of HMPC activities, review draft sections of the plan, and offer comments and suggestions through a special email account, tuscaloosa@hazardmitigationplan.com .
- Contacting HMPC members and Tuscaloosa County EMA staff.
- Contacting planners by email through the special email account noted above.
- Contacting elected officials of each jurisdiction.
- Attending public hearings of the local governing bodies and offering comments.

2.4 Multi-Jurisdictional Plan Adoption

All local government jurisdictions and school boards in Tuscaloosa County have actively participated in the planning process. Representatives from each local government and school board served on the Hazard Mitigation Planning Committee and attended each of the meetings. The committee was responsible for updating materials, reviewing sections of the plan, and recommending changes to the plan. Upon completion of the plan each of the seven municipalities (Brookwood, Coaling, Coker, Lake View, Vance, Northport, and Tuscaloosa) along with the Tuscaloosa County Commission, the University of Alabama, the Tuscaloosa City and County School Boards, and the Tuscaloosa County Volunteer Fire Association passed a formal resolution adopting the Tuscaloosa County Hazard Mitigation Plan. By adopting this multi-jurisdictional hazard mitigation plan Tuscaloosa County and the listed local governments and school boards will be eligible applicants for mitigation monies through the various Hazard Mitigation Assistance programs offered by FEMA. The model Adopting Resolution can be found in Appendix J.

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

The advisory on page 27 of the FEMA Local Multi-Hazard Mitigation Planning Guidance, July 1, 2008, 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.*

Since 2008, 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 here and incorporated into the vulnerability components found in sections 5.5 through 5.10 of Chapter 5 Risk Assessment in this 2014 plan update

3.2 Summary of Plan Updates

This chapter replaces *Section Two: General Characteristics* of the 2009 Tuscaloosa County Plan Update in its entirety. This 2014 update presents much more thorough profiles of Tuscaloosa County and its communities.

3.3 Geographic Setting and History

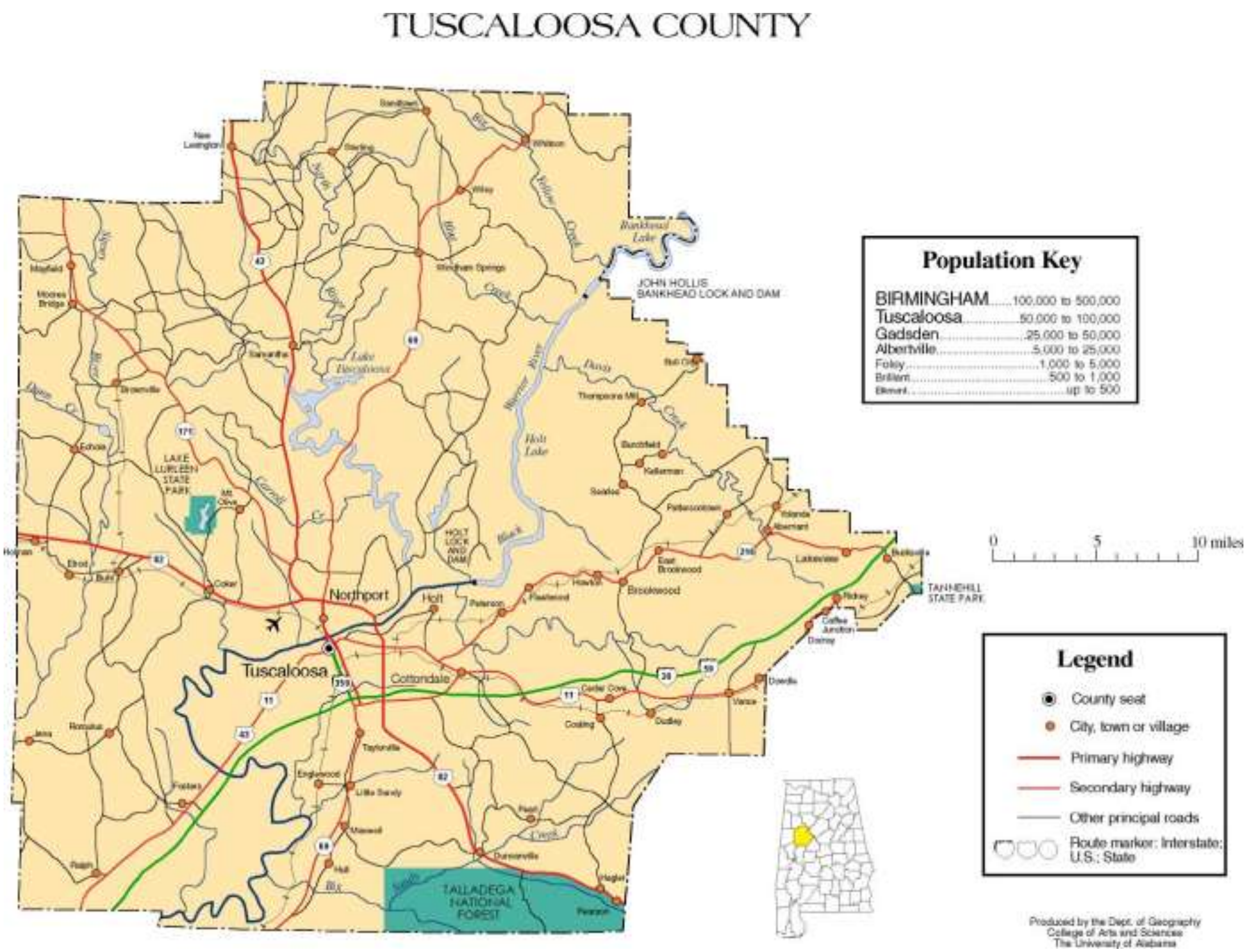
Tuscaloosa County

On February 6, 1818, Tuscaloosa County, Alabama was established by the state legislature. Tuscaloosa County was named for the Choctaw Indian word for the Black Warrior River, which runs through the county. It is the second largest county in Alabama by land area and third largest by total area. Located in West Central Alabama, Tuscaloosa County straddles the Appalachian Highlands and the Gulf Coastal Plain. Part of the Talladega National Forest is located within the county. Adjacent counties include Walker, Jefferson, Bibb, Hale, Greene, Pickens, and Fayette.

Tuscaloosa County encompasses 1,366 square miles (land and water) and is comprised of the following nine communities. Each of the nine communities is operated by a mayor-town council form of government.

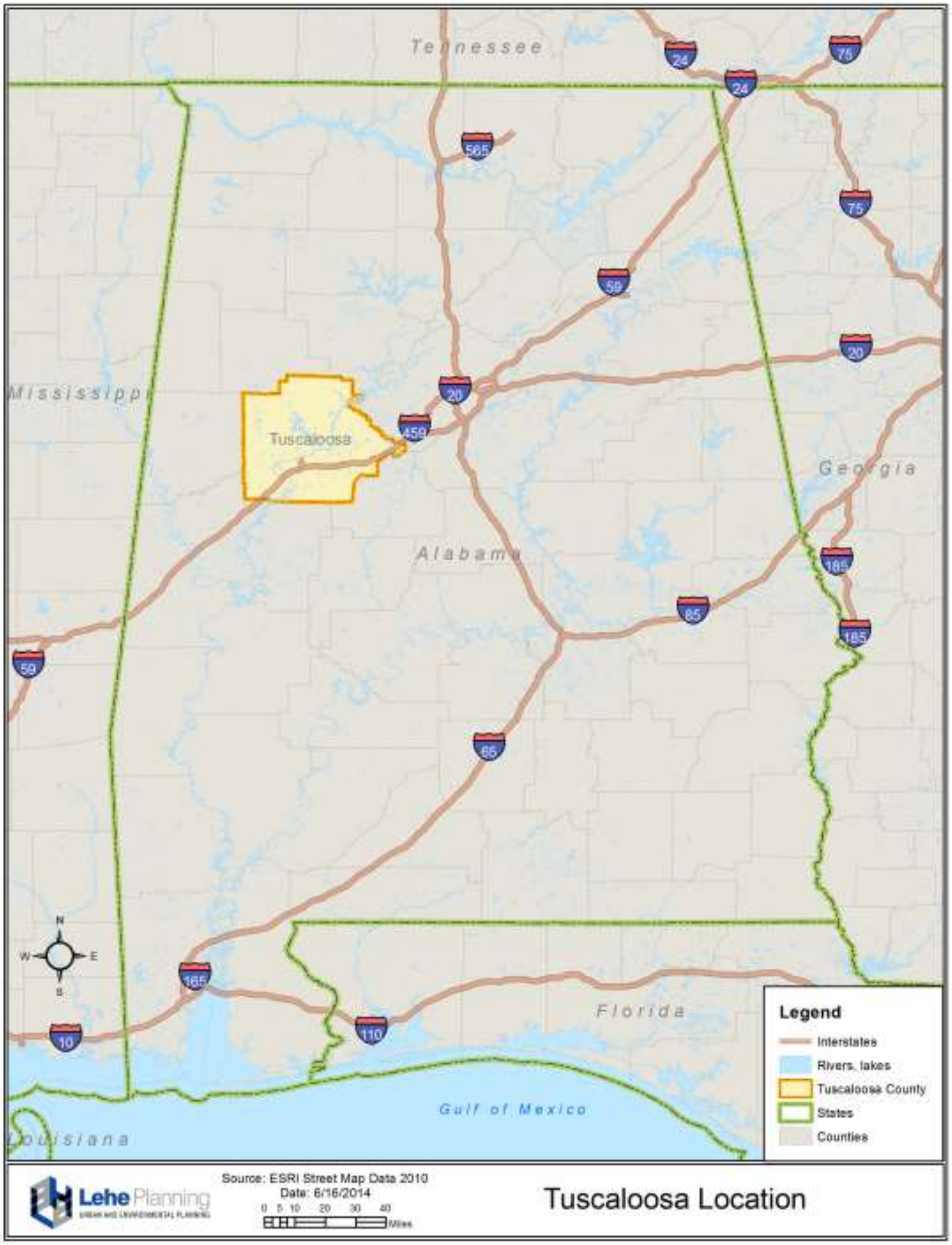
- Town of Brookwood
- Town of Coaling
- Town of Coker
- Town of Lake View
- Town of Moundville (partly in Hale County)
- City of Northport
- City of Tuscaloosa
- Town of Vance (partly in Bibb County)
- Town of Woodstock (partly in Bibb County)

Map 3-1. Tuscaloosa County



Tuscaloosa County, population 194,656 (Census 2010), is located in west central Alabama as shown in Map 3-2. Tuscaloosa County is part of a three county area (others include Hale and Pickens) comprising the Tuscaloosa Metropolitan Statistical Area.

Map 3-2. Location of Tuscaloosa County



Town of Brookwood

The Town of Brookwood, population 1,828 (Census 2010), is located in east central Tuscaloosa County along Alabama state highway 216 and Interstate 20/59 (as shown on Map 3-3). The town is 8.13 square miles with a population density of 226 per square mile. Brookwood is set in the foothills of the Appalachian Mountains and enjoys easy access to the Black Warrior River, CSX railroads, and Amtrak. The town has a large park consisting of two playgrounds, six baseball and softball fields, as well as tennis and volleyball courts. Recreation opportunities, such as fishing, boating, picnicking, and swimming are also enjoyed at the Black Warrior River.

Source: www.brookwoodalabama.com

Town of Coaling

Located along U.S. Highway 11 and south of Interstate 20/59, the Town of Coaling represents a small town in close proximity to urban amenities. The town's population of 1,657 (2010 Census) is located east of the City of Tuscaloosa between Cottondale and Vance. The town comprises approximately 3.7 square miles, of which 0.1 square miles is water. The April 27, 2011 tornadoes devastated parts of Coaling, in which three homes were completely destroyed, ten homes were severely damaged, and many others sustained at least light damage. The town has a tornado shelter located at the #1 Fire Station on U.S. Highway 11, with a maximum capacity of 95. The town is also home to the Charley Foster Recreation Complex, consisting of a playground, park, and baseball/softball fields.

Source: coalingalabama.com

Town of Coker

The Town of Coker, population 979 (2010 Census), is located in western Tuscaloosa County as shown in Map 3-3. The City is 2.3 square miles, all of which is land. Incorporated in 1999, Coker is a quiet community with an excellent school system. The town has a volunteer fire department and its own water authority. U.S. Highway 82 runs through the northeastern portion of the town, while C.R. 140 travels through central Coker.

Source: townofcoker.com

Town of Lake View

The Town of Lake View, population 1,943 (2010 Census), is located in the far eastern section of Tuscaloosa County as shown in Map 3-3. The town has a total area of 1.8 square miles, of which 1.6 square miles is land and 0.2 square miles is water. Lake View is home to the Lake View Police Department and the Lake View Fire District (staffed/volunteer).

Town of Moundville

Source: orbitingfrog.com

The Town of Moundville, population 2,427 (2010 Census), is located on Alabama Highway 69, at the very southern tip of the Black Warrior River in Tuscaloosa County as shown in Map 3-3. The town is partially located in Hale County and is known for its beautiful landscapes and Native American mounds. The Town is 4.0 square miles, 3.9 of which is land and .04 is water. Moundville is home to a National Historic Landmark, the Moundville Archaeological Park, which spans 320 acres and contains 26 prehistoric Native American earthwork mounds, burial sites, and artifacts. The town was created in 1891 and in 1904 was almost wiped off the map, due to a tornado with a 200-yard path that ripped through the town. Moundville recovered and built a bank, school, and a newspaper. In 1932, another tornado damaged parts of the town, but the citizens of Moundville were determined to again rebuild.

City of Northport

The City of Northport, population 23,330, is the second largest city in Tuscaloosa County. According to early accounts, the city was settled in 1813 and its operations revolved around the river. Northport was incorporated in 1871. Located directly north of the City of Tuscaloosa, on the Black Warrior River, the city is approximately 14.9 square miles, of which 14.6 is land. The city shares a boundary with the City of Tuscaloosa, most of which is the Black Warrior River. Northport is home to a DCH Regional Medical Facility, Kentuck Arts Campus, boutiques, restaurants, the Northport Heritage Museum, and the Alabama Blues Project. Northport's Downtown Riverfront Master Plan won a 2009 outstanding planning award.

Source: www.cityofnorthport.org

City of Tuscaloosa

Source: www.relocatinginformation.com

Located on the banks of the Warrior River, the City of Tuscaloosa is the largest in Tuscaloosa County with a population of 90,468 (2010 Census) and comprising 70.3 total square miles. Founded in 1819, the city was named after a Native American chief who battled and was defeated by Hernando de Soto. The county seat originated in the town of Tuscaloosa in 1819, moved to New Town in 1822, and then back to Tuscaloosa not long after that. Tuscaloosa was Alabama's capital from 1826 to 1846, a time where New Town was made a part of Tuscaloosa. A tornado, during the 1840s, destroyed much of the original architecture in the area.

Started in 1831, Tuscaloosa is home to the University of Alabama, boasting 15 football national championships. Shelton State Community College and Stillman College are also located in the city. Tuscaloosa is also home to Mercedes-Benz U.S. International, Bama Theatre, various parks, Alabama Museum of Natural History, Bama Belle Riverboat, Children's Hands on Museum, and many other cultural and entertainment venues. Tuscaloosa bore witness to the devastating tornadoes on April 27, 2011, whereby 44 people died and over 1,500 injuries were sustained. Entire neighborhoods were "removed from the map" (Mayor Walt Maddox).

Town of Vance

The Town of Vance, population 1,529 (2010 Census), is located in eastern Tuscaloosa County and is partially located in Bibb County, as shown in Map 3-3. Vance is situated between I-59/20 and U.S. Highway 11 between the cities of Tuscaloosa and Birmingham. The town was settled in 1830, originally named Trion and served as a trading post on the Old Huntsville Road. Trion was renamed Smallwood in 1872, after sawmill owner Charles Smallwood and again renamed in 1879 to Vance, in honor of Dr. William Vance. The town is 10.2 square miles, the majority of which is land. Vance is home to the Mercedes-Benz M-Class Assembly Plant, which manufactures the M-Class, R-Class, and the GL-Class.

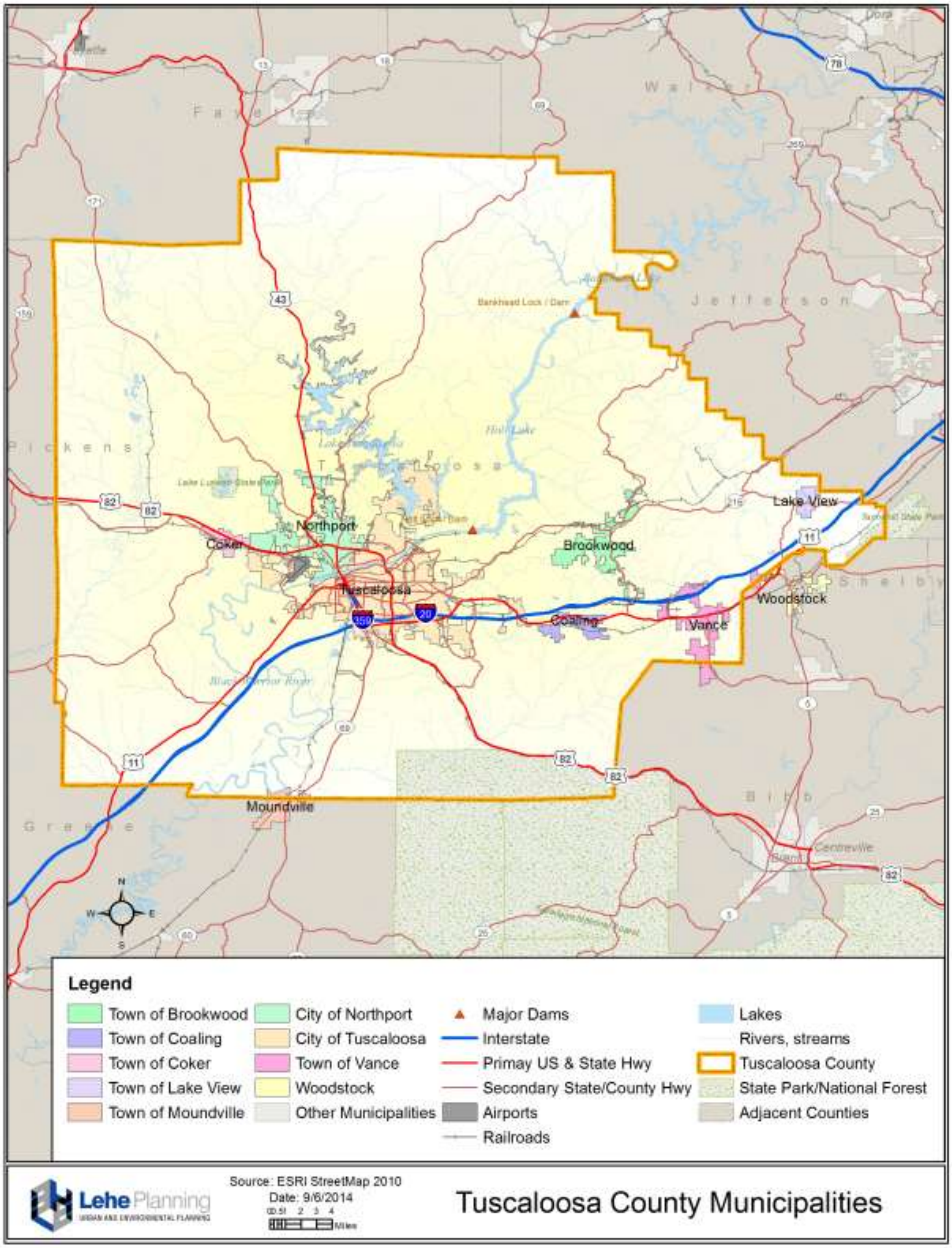
Source: www.agcglasstools.com

Town of Woodstock

Officially re-named in 2000, the Town of Woodstock is located along Alabama Highway 5, straddling Tuscaloosa and Bibb counties (shown in Map 3-3). Settled in the 1820s, Woodstock has a population of 1,428 (2010 Census). While the original town was named after the settler's hometown of Woodstock, England, it was incorporated in 1996 as the Town of North Bibb. U.S. Highway 11 passes northwest of the town's center, approximately 31 miles to downtown Birmingham and 26 miles to Tuscaloosa. The town has a total area of 2.8 square miles, of which 0.36% is water. Woodstock is home to Woodstock Dixie Youth Baseball Park, Green Pond Park, senior center, library, schools, churches, and two historical landmarks designated by the Alabama Register of Landmarks and Heritage: Green Pond Presbyterian Church and Cemetery and Woodstock United Methodist Church.

Source: www.woodstockalabama.com

Map 3-3. Tuscaloosa County Municipalities



3.4 Government

The Tuscaloosa County Commission, with the courthouse offices located in Tuscaloosa, is composed of a four Commissioners that are elected by the voters in each of the geographic districts.

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

- The Town of Brookwood is governed by a mayor and a five-member town council, elected by district.
- The Town of Coaling is governed by a mayor and a five-member town council. Members represent “places” or “seats” rather than running from a geographic district.
- The Town of Coker is governed by a mayor and a five-member town council, elected at-large.
- The Town of Lake View is governed by a mayor and a five-member town council, elected at-large.
- The Town of Moundville is governed by a mayor and a five-member town council, elected by district.
- The City of Northport is governed by a mayor and five council members, elected by district.
- The City of Tuscaloosa is governed by a mayor and a seven-member city council, elected by district.
- The Town of Vance is governed by a mayor and five-member town council. Members represent “places” or “seats” rather than running from a geographic district.
- The Town of Woodstock is governed by a mayor and a five-member town council, elected at-large; they serve four year terms.

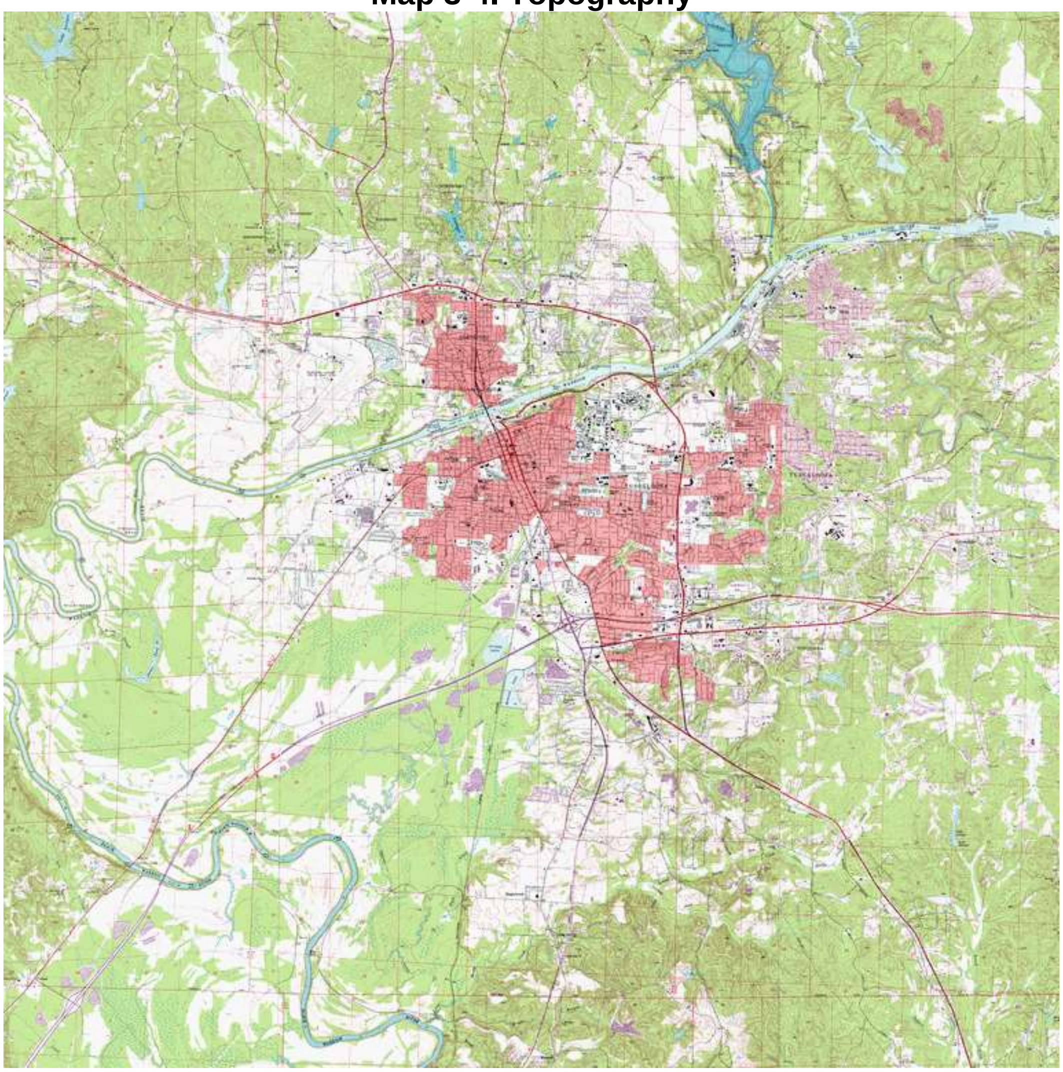
3.5 Physical Features

Tuscaloosa County lies within parts of three separate physiographic provinces--the Appalachian Plateau, Valley and Ridge, and Coastal Plain. Most of the northeastern part of the county is within the Appalachian Plateau physiographic province and is underlain by the Pottsville Formation of Pennsylvanian age. This formation is composed of sandstone, siltstone, shale, conglomerate, and beds of coal. This formation dips to the southwest at about 30 feet per mile in the northern part of the county and about 120 feet per mile in the southern part. The southwestern part of the county lies in the Coastal Plain physiographic province and is underlain by the Coker, Gordo, and Eutaw Formations of Late Cretaceous age. These units consist mainly of unconsolidated deposits of sand, gravel, and clay.

The geography of the area is forested and hilly in some areas, and low-lying and swampy in other areas. Elevations above mean sea level range from about 800 feet in the Valley and Ridge to 100 feet in the Black Warrior River Valley. The Black Warrior River system is the largest watershed completely located in Alabama. It is sourced from Locust Fork, Mulberry Fork, and Sipsey Fork. The Upper Tombigbee watershed drains portions of Tuscaloosa County (in the west). Additionally, the Talladega National Forest is partially located in the county.

Map 3-4 "Topography" shows the major physiographic features of Tuscaloosa County. Approximately 692,687 acres of Tuscaloosa County's 864,640 acres are forestland (Alabama Forest Commission 2012 Forest Resource Report). The dominant tree varieties in Tuscaloosa County forests are the oak/pine, loblolly shortleaf pine, and oak/gum cypress along the Black Warrior River. Tuscaloosa County's location within Alabama's distribution of forest types is depicted in Map 3-5 "Alabama Forest Types."

Map 3-4. Topography



Source: USGS, 2013

Map 3-5. Alabama Forest Types

3.6 Climate

Tuscaloosa County's climate is humid with mild winters and hot summers. The average annual rainfall is 54 inches. The mean temperature is 63.7 degrees Fahrenheit. The mean annual low is 46.4 degrees Fahrenheit in January and the mean high is 91.2 degrees Fahrenheit in July. Table 3-1 shows the weather observations for Tuscaloosa County.

Table 3-1. Weather Observations

Category	Observation
Average Winter Temperature	46.4° F
Average Winter Minimum Temperature	35.6° F
Lowest Temperature (January 19, 1977)	-1° F
Average Summer Temperature	80.4° F
Average Summer Maximum Temperature	91.2° F
Highest Temperature (July 24, 1952)	107° F
Total Annual Precipitation	54.0 inches
Heaviest One-Day Rainfall (September 5, 2011)	7.3 inches
Average Season Snowfall	0.6 inches

Source: SE Regional Climate Center, 2012

3.7 Demographics

Population Growth and Density

Tuscaloosa County has experienced an increase in population over recent decades. In 2010, the population of the County was 93,019, a 13.1% increase over the 2000 level of 82,231. Table 3-2 contains the populations of the County and municipalities/towns and their percent increase from 1990 to 2010 according to the U. S. Census. Map 3-6 show the U. S. Census 2010 population data by jurisdiction.

Table 3-2. Population Change from 1990 to 2010

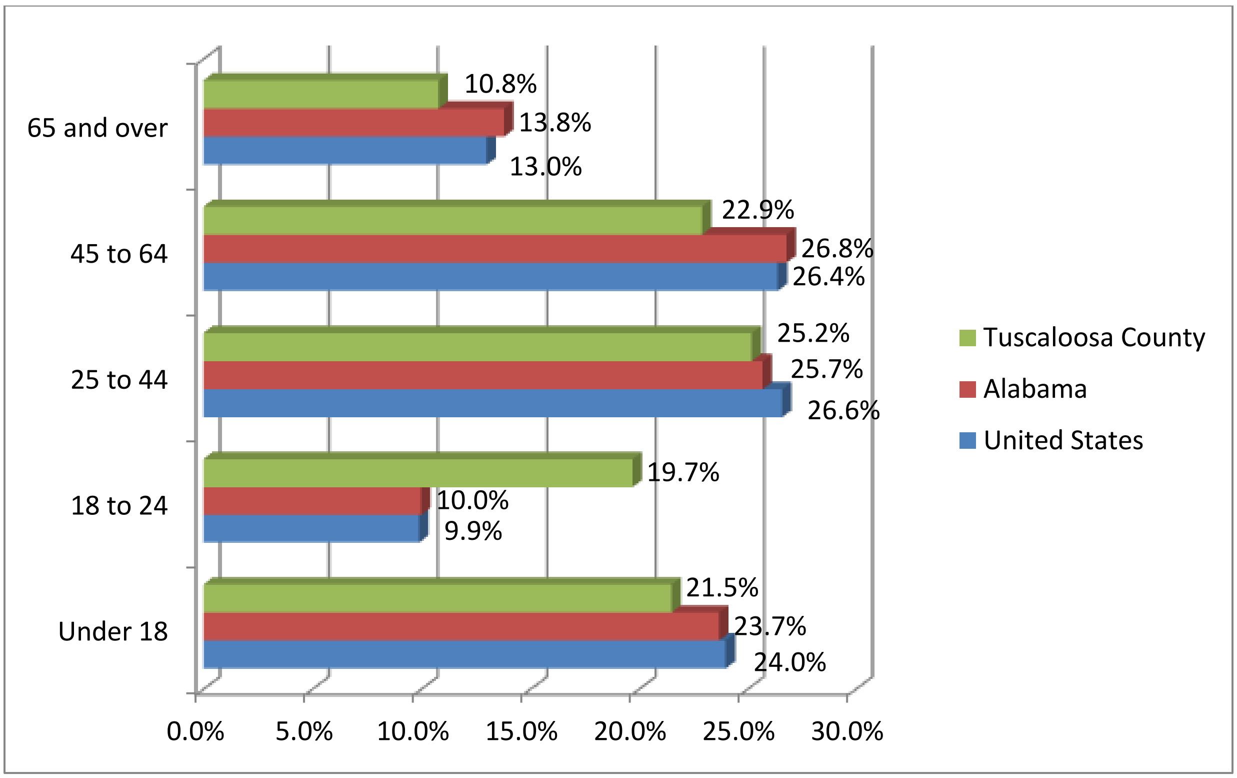
Jurisdiction	1990	2000	Number Change	Percent Change	2010	Number Change	Percent Change
Tuscaloosa County	150,522	164,875	14,353	9.5%	194,656	29,781	18.1%
Brookwood	658	1,483	825	125.4%	1,828	345	23.3%
Coaling	1,181	1,115	-66	-5.6%	1,657	542	48.6%
Coker	956	808	-148	-15.5%	979	171	21.2%
Lake View	1,012	1,357	345	34.1%	1,943	586	43.2%
Moundville	--	1,809	--	--	2,427	618	34.2%
Northport	17,297	19,435	2,138	12.4%	23,330	3,895	20.0%
Tuscaloosa	77,759	77,906	147	0.2%	90,468	12,562	16.1%
Vance	248	500	252	101.6%	1,529	1,029	205.8%
Woodstock	--	--	--	--	1,428	--	--

Source: U.S. Census Bureau, 2010

Age Distribution

The 2010 Census indicates that Tuscaloosa County's population has a greater percentage of residents age 18 to 24, at 19.7% compared to 10% for the state and 9.9% for the country. This is likely due to the presence of the University of Alabama, Shelton State Community College, and Stillman College. The Under 18 age group and the 25 to 44 age group have almost equal distributions to that of the state and the U.S., averaging at 23% and 25.8%, respectively. The 25 to 64 age group comprises 48.1% of the total population. This age group is an important asset in realizing the County's full social and economic potential since people between the ages of 25 and 64 are usually the most productive in the County. Approximately 11% of the county's population is 65 +, which is important to note due to the impact on the community facilities required to serve this age group such as health care facilities, as well as elderly and public assistance programs. This percentage is slightly less than the State of Alabama and the U.S., reinforced by the higher percentage of college-aged individuals in the county. Chart 3-1 depicts the breakdown of the County by the age of residents, compared to state and country figures.

Chart 3-1. Tuscaloosa County Population by Age



Sources: US Census Bureau, 2010

Race and Gender

According to the 2010 Census (shown in Table 3-3), throughout Tuscaloosa County, whites comprise 66.3% of the population, which represents a slight decline from 2000 (68.1%). The African-American population comprises 29.6% of the total Tuscaloosa County population. The most diverse localities within the county are Tuscaloosa with 41.5% African American, 0.2% American Indian, 1.8% Asian and 1.5% Other Race; and Moundville with 40.4% African American, 0.7% American Indian, 0.7% Asian, and 0.2% Other Race. The Hispanic population of any race comprises 3.1% in the county as a whole, with 5.6% residing in Vance, 4.1% residing in Northport, and 3.0% residing in Tuscaloosa. As shown in Table 3-4, the county is 48.5% male and 51.5% female. The female population outnumbers the male population in all jurisdictions, except for Coaling and Coker, where males slightly outnumber the female population.

Table 3-3. Population by Race and Hispanic Origin

Community	White	Black/African American	American Indian	Asian	Other Race	Two or More Races	Hispanic (of any race)
Tuscaloosa County	66.3%	29.6%	0.3%	1.2%	1.5%	1.1%	3.1%
Brookwood	92.2%	5.3%	0.7%	0.1%	0.4%	1.4%	2.0%
Coaling	86.4%	11.4%	0.1%	0.1%	0.4%	1.7%	0.8%
Coker	95.2%	2.0%	0.2%	0.9%	1.5%	0.1%	1.8%
Lake View	93.9%	4.2%	0.1%	0.7%	0.2%	0.9%	0.6%
Moundville	56.2%	40.4%	0.7%	0.7%	0.6%	1.4%	1.8%
Northport	68.4%	26.9%	0.3%	1.1%	2.0%	1.1%	4.1%
Tuscaloosa	53.8%	41.5%	0.2%	1.8%	1.5%	1.1%	3.0%
Vance	88.8%	7.2%	0.4%	0.6%	1.7%	1.3%	5.6%
Woodstock	94.3%	3.4%	0.1%	0.1%	1.1%	1.0%	2.1%

Sources: U.S. Census Bureau, 2010

Table 3-4. Population by Gender

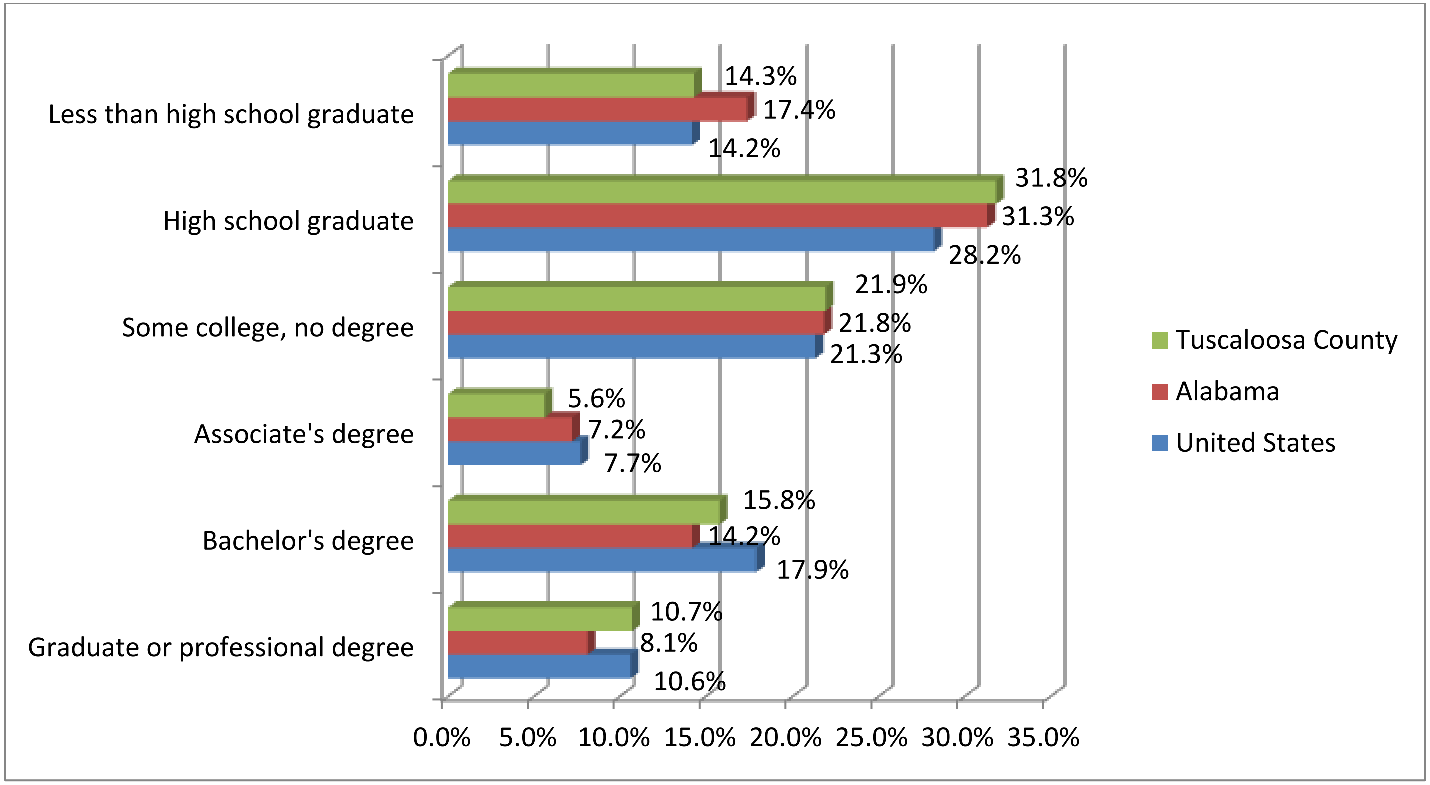
Community	Male	Female
Tuscaloosa County	48.5%	51.5%
Brookwood	48.2%	51.8%
Coaling	50.2%	49.8%
Coker	50.5%	49.5%
Lake View	49.2%	50.8%
Moundville	48.0%	52.0%
Northport	46.5%	53.5%
Tuscaloosa	48.1%	51.9%
Vance	52.0%	48.0%
Woodstock	50.1%	49.9%

Source: U.S. Census Bureau, 2010

Educational Attainment

Of Tuscaloosa County's population of 25 years or older, 85.8 percent are high school graduates or higher, and 26.5% percent of those have a bachelor's degree or higher. Relative to the State of Alabama, Tuscaloosa County has a greater population receiving a bachelor’s degree or higher (22.3%); however, the figure is 2.0% less than that of the nation. The greater percentage of people receiving a bachelor’s degree or higher is likely influenced by the presence of a large state university and two colleges in the county. Chart 3-2 depicts the educational attainment of Tuscaloosa County, State of Alabama, and United States residents, according to the American Community Survey, 2008-2012 estimates.

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



Source: U.S. Census Bureau, 2008-2012 American Community Survey 5-year Estimates

Income

It is important to identify the income variations and populations below poverty level. Table 3-5 shows the median household income and poverty level data for the jurisdictions in Tuscaloosa County, the State of Alabama and the United States.

The median household income for Tuscaloosa County is $43,996 compared to a state average of $43,160, and U.S. average of $53,046 (2010 Census). Interestingly, seven of the nine jurisdictions in Tuscaloosa County have a median household income higher than that of the county and the state; these jurisdictions include Brookwood, Coaling, Coker, Lake View, Northport, Vance, and Woodstock. Lake View maintains the highest median household income ($84,219), at nearly twice that of the county and also has the lowest percentage of people below poverty level (2.1%). The City of Tuscaloosa has the highest percentage of people below poverty level, comprising 27.6% and also has the lowest median household income of all jurisdictions in the county. Despite Coaling and Woodstock having higher median household incomes than the county or state, they have the second and third highest percentage below poverty level in the county (15.8% and 15.2%, respectively). Still, these percentages are less than the county, state, and nation.

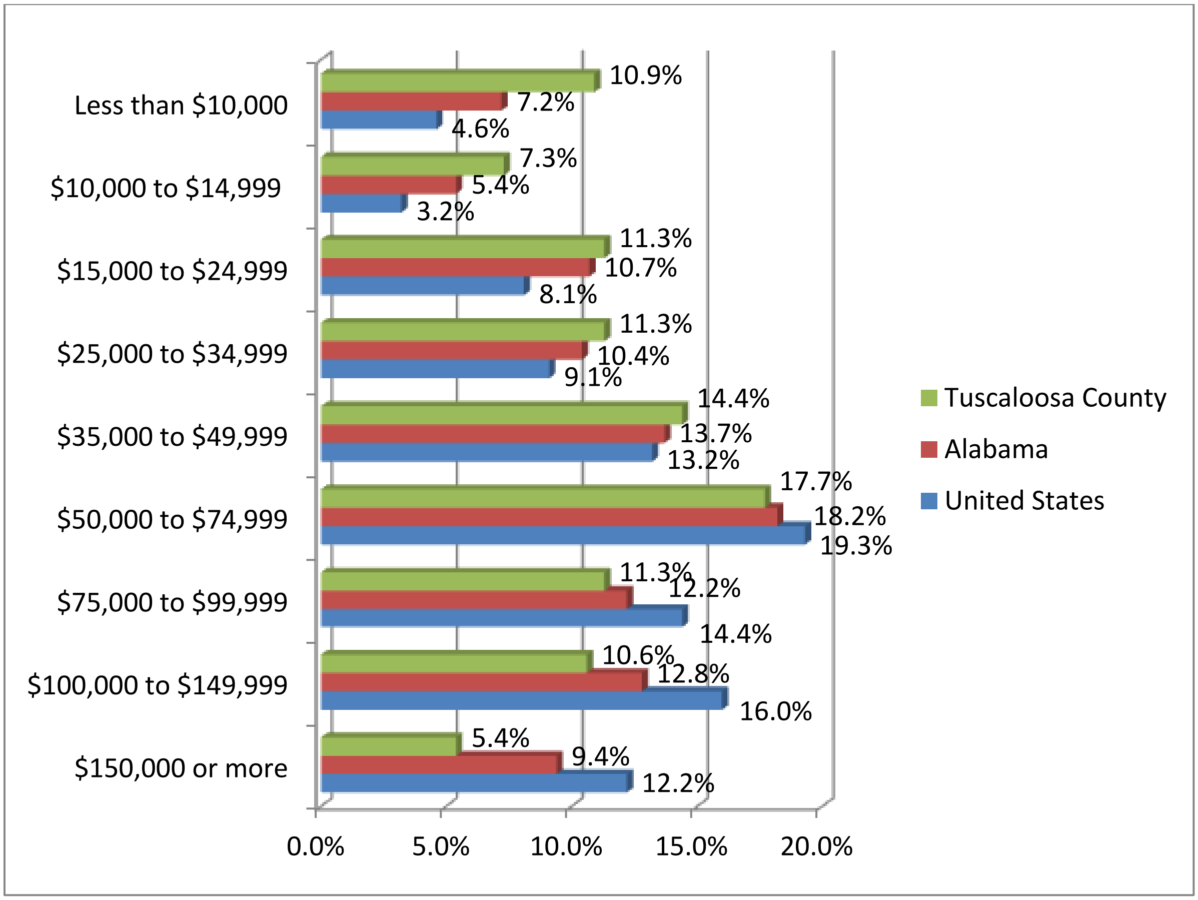
Table 3-5. Comparison of Income and Poverty Levels

Geographic Area	Median Household Income	Persons Below Poverty Level	Percent Below Poverty Level
Brookwood	$56,202	236	11.3%
Coaling	$65,554	295	15.8%
Coker	$44,688	80	7.7%
Lake View	$84,219	41	2.1%
Moundville	$42,109	357	15.7%
Northport	$51,628	2,907	12.7%
Tuscaloosa	$35,785	22,665	27.6%
Vance	$73,182	69	5.4%
Woodstock	$44,531	238	15.2%
Tuscaloosa County	$43,996	35,496	19.2%
Alabama	$43,160	842,292	18.1%
U.S.	$53,046	44,852,527	14.9%

Source: US Census Bureau, 2008 – 2012 American Community Survey

Chart 3-3 shows the household income distribution for Tuscaloosa County, compared to that of the state and the nation. Approximately 18% of Tuscaloosa County households earn between $50,000 and $74,999, while 14.4% earn between $35,000 and $49,999. Of the higher income brackets, Tuscaloosa county households comprise a slightly lower percentage than Alabama or the U.S. Alternatively, Tuscaloosa County has a higher percentage of households earning $15,000 or less (18.2%) than the state (12.6%) or the nation (7.8%).

Chart 3-3. Household Income Distribution



Source: U.S. Census Bureau, 2008-2012 American Community Survey

3.8 Economy

Business and Industry

According to the Tuscaloosa County Chamber of Commerce, approximately 98,800 people are employed in non-agricultural jobs, with 25% producing goods and 75% providing services. Tuscaloosa County has an ample qualified and educated workforce and abundant natural resources. In Tuscaloosa County, education reigns supreme as the greatest employer. The University of Alabama alone employs almost 11,000 people and Tuscaloosa County, the City of Tuscaloosa and Shelton State Community College adds to that figure (see Table 3-6). Other top employers include DCH Regional Medical Center, Mercedes-Benz, and The Westervelt Company. Table 3-6 lists the "Major Employers" with at least 100 employees. Map 3-6 depicts the location of these companies.

Map 3-6. Major Employers

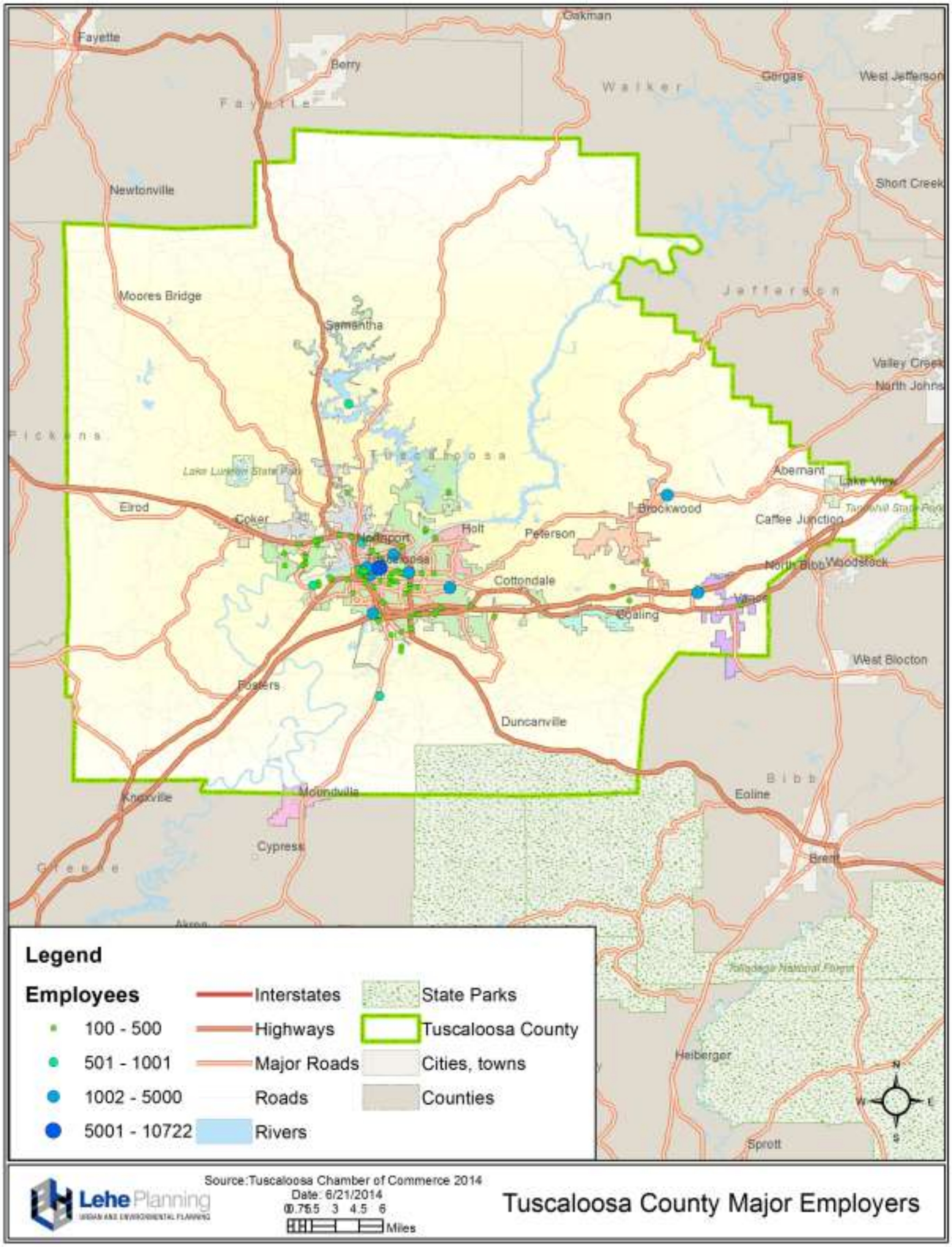


Table 3-6. Major Employers

Company	Address	City	# of Employees	Industry
University Of Alabama	801 Campus Dr	Tuscaloosa	10,722	Educational Services
DCH Regional Medical Center	809 University Blvd E	Tuscaloosa	3,481	Health Services
Mercedes-Benz US International	1 Mercedes Dr	Vance	3,088	Transportation Equipment
The Westervelt Company	1400 Jack Warner Pkwy NE	Tuscaloosa	2,780	Allied and Paper Products
Tuscaloosa County Board of Education	2314 9th St	Tuscaloosa	2,034	Educational Services
Jim Walter Resources, Inc.	16243 Highway 216	Brookwood	1,850	Quarrying and Mining of Non-Metallic Minerals other than Fuels
Tuscaloosa City Board of Education	1210 21st Ave	Tuscaloosa	1,370	Educational Services
City of Tuscaloosa	2201 University Blvd	Tuscaloosa	1,366	Legislative, Executive and General Government other than Finance
Phifer Wire Products Inc.	4400 Kauloosa Ave	Tuscaloosa	1,231	Fabricated Metal Products other than Transport and Machinery Equipment
US Veterans Medical Center	3701 Loop Rd	Tuscaloosa	1,080	Health Services
Northport Hospital Med Center	2700 Hospital Dr	Northport	884	Health Services
Shelton State Community College	9500 Old Greensboro Rd	Tuscaloosa	700	Educational Services
McAbee Construction, Inc.	5724 21st St	Tuscaloosa	589	Fabricated Metal Products other than Transport and Machinery Equipment
Peco Foods	1020 Lurleen B Wallace Blvd N	Tuscaloosa	541	Agricultural Production - Animal and Livestock Specialties
Boone Newspapers, Inc.	15222 Freemans Bend Rd	Northport	520	Publishing, Allied and Printing Industries
Tuscaloosa County	714 Greensboro Ave	Tuscaloosa	515	Legislative, Executive and General Government other than Finance
Bryce Hospital	200 University Blvd	Tuscaloosa	477	Health Services
Nucor Steel Tuscaloosa, Inc.	1700 Holt Rd Ne	Tuscaloosa	425	Manufacturing, Primary Metal Industries
Wal-Mart Supercenter	1501 Skyland Blvd E	Tuscaloosa	414	General Merchandise Stores
Alabama Dept. of Transportation	2715 Skyland Blvd E	Tuscaloosa	412	Administration of Economic Programs
Wal-Mart Supercenter	5710 McFarland Blvd	Northport	390	General Merchandise Stores
Partlowe Developmental Center	1700 University Blvd E	Tuscaloosa	380	Health Services
Coral Industries Inc.	3010 Rice Mine Rd NE	Tuscaloosa	330	Clay, Concrete, Glass and Stone Products
Hunt Refining	1855 Fairlawn Rd	Tuscaloosa	330	Manufacturing, Petroleum

Company	Address	City	# of Employees	Industry
ZF Lemforder Corp.	1200 Commerce Dr	Tuscaloosa	326	Transportation Equipment
Corus Tuscaloosa	1700 Holt Rd Ne	Tuscaloosa	320	Primary Metal Industries
Zeigler R L Packing Co.	730 Energy Center Blvd	Northport	320	Kindred and Food Products
City of Northport	3500 McFarland Blvd	Northport	315	Legislative, Executive and General Government other than Finance
Seapac, Inc.	502 Bear Creek Rd	Tuscaloosa	310	Business Services
Johnson Controls, Inc.	15911 Progress Dr	Cottondale	309	Miscellaneous Manufacturing Industries
Eutaw Medical Clinic Board	515 Hargrove Rd E	Tuscaloosa	290	Health Services
Target Stores	1901 13th Ave E	Tuscaloosa	290	General Merchandise Stores
Northstar Paramedic Services	2106 17th Ave # D	Tuscaloosa	280	Suburban, Local Transit and Interurban Highway Passenger Transport
Heritage Health Care & Rehabilitation	1101 Snows Mill Ave	Tuscaloosa	260	Health Services
Michelin/BF Goodrich Tire Manufacturing	5101 21st St	Tuscaloosa	260	Manufacturing, Rubber and Misc. Products
Rite Aid	521 University Blvd E	Tuscaloosa	260	Retail Trade, Miscellaneous
Alabama Power Company	915 Queen City Ave	Tuscaloosa	250	Transportation, Communication, Utilities
Community Services Programs W. AL	601 17th St	Tuscaloosa	250	Social Services
Inteva Cottondale	11005 Ed Stephens Rd	Tuscaloosa	250	Manufacturing, Motor Vehicle
Stillman College	3601 Stillman Blvd	Tuscaloosa	240	Educational Services
Randall Publishing Co.	3200 Rice Mine Rd NE	Tuscaloosa	221	Publishing, Allied and Printing Industries
Southeast Cancer Network PC	1400 Afflink Pl	Tuscaloosa	220	Health Services
Checkers Drive-In Restaurant	521 15th St	Tuscaloosa	210	Eating and Drinking Establishments
Cottondale Wood Products Division	1616 44th Ave	Tuscaloosa	210	Wood and Lumber Products other than Furniture
Northern Alabama Peterbilt	6801 McFarland Blvd	Northport	210	Gasoline Service Stations and Automotive Dealers
Faurecia Interior Systems	1401 Industrial Park Dr	Tuscaloosa	200	Manufacturing, Motor Vehicle
Forest Manor Nursing Home	2215 32nd St	Northport	200	Health Services
S T Bunn Construction Company	1904 University Blvd	Tuscaloosa	200	Construction - Special Trade Contractors
Belk Department Store	1701 McFarland Blvd E	Tuscaloosa	195	General Merchandise Stores
Calvary Baptist Church Family Life Center	721 Greensboro Ave	Tuscaloosa	190	Miscellaneous Establishments
Glen Haven Health & Rehabilitation	2201 32nd St	Northport	190	Health Services
Harper Center	200 University Blvd	Tuscaloosa	190	Health Services

Company	Address	City	# of Employees	Industry
Racon, Inc.	7300 Commerce Dr		190	Building Construction - Operative Builders and General Contractors
Townsend Ford, Inc.	5801 McFarland Blvd E # E	Tuscaloosa	190	Gasoline Service Stations and Automotive Dealers
Delphi Thermal & Interial	11005 Ed Stephens Rd	Cottondale	180	Transportation Equipment
Fold-Pak	1400 River Ro Dr	Tuscaloosa	180	Allied and Paper Products
Four Points Hotel By Sheraton	320 Paul W Bryant Dr E	Tuscaloosa	180	Camps, Rooming Houses, Hotels and Other Lodging Places
Roland Pugh Construction, Inc.	400 McFarland Blvd	Northport	180	Heavy Construction other than Building Construction
Taylor Hardin Secure Med Facility	1301 Jack Warner Pkwy NE	Tuscaloosa	180	Health Services
Tuscaloosa News	315 28th Ave	Tuscaloosa	180	Publishing, Allied and Printing Industries
JVC America, Inc.	1 Jvc Rd	Tuscaloosa	175	Electrical, Electronic and Components other than Computer Equipment
Bruno's Food & Pharmacy	2001 McFarland Blvd E	Tuscaloosa	170	Food Stores
Foodmax Supercenter	5510 McFarland Blvd	Northport	170	Food Stores
Indian River Mental Health	1915 6th St	Tuscaloosa	170	Health Services
North River Yacht Club	8405 New Watermelon Rd	Tuscaloosa	170	Membership Organizations
Radicispandex	1301 Industrial Park Dr	Tuscaloosa	170	Allied and Chemical Products
Spiller Furniture Co.	5605 McFarland Blvd	Northport	170	Furnishing, Equipment and Home Furniture Stores
Flowers Baking Co.	546 15th St	Tuscaloosa	160	Kindred and Food Products
Lowe's	4900 Oscar Baxter Dr	Tuscaloosa	160	Mobile Home Dealers, Garden Supply, Building Materials and Hardware
Northport Public Works Dept.	1781 Harper Rd	Northport	160	Heavy Construction other than Building Construction
Panamerican Consultants, Inc.	924 26th Ave E	Tuscaloosa	160	Engineering, Management, Accounting, Research and Related Industries
Park Manor Health & Rehab LLC	2201 McFarland Blvd	Northport	160	Health Services
Tuscaloosa County Park Rec. Authority	614 Greensboro Ave	Tuscaloosa	160	Amusement and Recreation Services
University Medical Center	850 5th Ave E	Tuscaloosa	160	Health Services
Alice M KIDD Intermediate Care	200 University Blvd	Tuscaloosa	150	Health Services
Hanna Steel Corp.	1701 Boone Blvd	Northport	150	Primary Metal Industries
Sam's Club	1401 Skyland Blvd E	Tuscaloosa	150	General Merchandise Stores
Tuscaloosa City Transportation Dept.	1000 28th Ave	Tuscaloosa	150	Administration of Economic Programs

Company	Address	City	# of Employees	Industry
Southern Heat Exchanger Corp.	1600 Old Montgomery Hwy	Tuscaloosa	144	Fabricated Metal Products other than Transport and Machinery Equipment
Food World	641 Bear Creek Rd	Tuscaloosa	140	Food Stores
Ky Ken Kee, Inc.	18719 Highway 11 N	Vance	140	Wood and Lumber Products other than Furniture
Olive Garden Italian Restaurant	2100 McFarland Blvd E	Tuscaloosa	140	Eating and Drinking Establishments
Parisian	1701 McFarland Blvd E	Tuscaloosa	140	General Merchandise Stores
Planit Solutions, Inc.	3800 Palisades Dr	Tuscaloosa	140	Business Services
Spiller Central	200 15th St	Tuscaloosa	140	Furnishing, Equipment and Home Furniture Stores
T T L, Inc.	3516 Greensboro Ave	Tuscaloosa	140	Engineering, Management, Accounting, Research and Related Industries
ELK Corp.	4602 Stillman Blvd	Tuscaloosa	138	Mobile Home Dealers, Garden Supply, Building Materials and Hardware
NRV Manufacturing Co., Inc.	2636 Shady Bank Ln	Northport	130	Apparel, Finished Products from Fabrics & Similar Materials
YMCA of Tuscaloosa County	2405 Paul W Bryant Dr	Tuscaloosa	130	Membership Organizations
Foodmax	400 McFarland Blvd	Northport	120	Food Stores
JC Penney Co.	1701 McFarland Blvd E	Tuscaloosa	120	General Merchandise Stores
Resources For Independence	3079 Palisades Ct # B	Tuscaloosa	120	Social Services
Sunland Construction	5401 Kauloosa Ave	Tuscaloosa	120	Building Construction - Operative Builders and General Contractors
Townsend Auto Glass and ACC	4701 McFarland Blvd E	Tuscaloosa	120	Gasoline Service Stations and Automotive Dealers
Regions Bank	504 Paul W Bryant Dr	Tuscaloosa	112	Depository Institutions
A & B Electric	2624 18th St	Tuscaloosa	110	Construction - Special Trade Contractors
Buffalo Rock Co.	401 65th St	Tuscaloosa	110	Miscellaneous Retail
Publix Supermarkets, Inc.	1190 University Blvd	Tuscaloosa	110	Food Stores
South Eastern Financial, Inc.	1300 McFarland Blvd NE # 100	Tuscaloosa	110	Holding and Other Investment Offices
Travel Centers Of America	3501 Buttermilk Rd	Cottondale	110	Gasoline Service Stations and Automotive Dealers
ISE Innomotive	1150 Industrial Park Dr	Tuscaloosa	102	Fabricated Metal Products other than Transport and Machinery Equipment
Sealy Realty Co., Inc.	1200 Greensboro Ave	Tuscaloosa	102	Real Estate
Accu Chek, Inc.	2410 6th St	Tuscaloosa	100	Business Services
Brookwood Oil Field Services	11756 Covered Bridge Rd	Brookwood	100	Gas and Oil Extraction

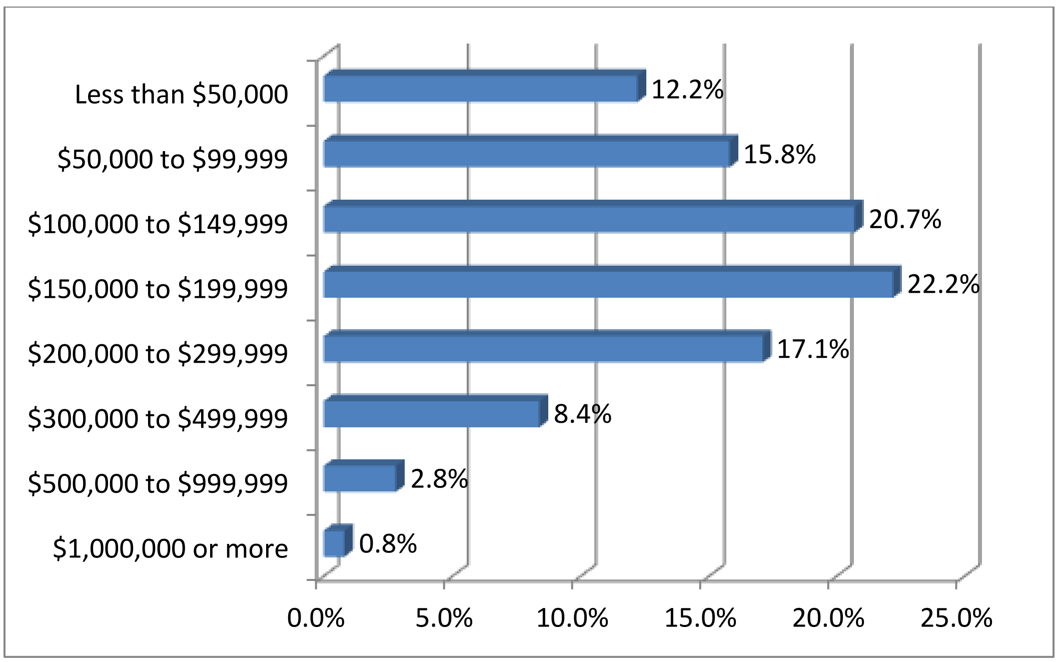
Company	Address	City	# of Employees	Industry
Hanna Truck Line, Inc.	1701 Boone Blvd	Northport	100	Motor Freight Transportation
KFC	1101 Lurleen B Wallace Blvd S	Tuscaloosa	100	Eating and Drinking Establishments
Maude L Whatley Health Center	2731 Ml King Jr Blvd	Tuscaloosa	100	Health Services
Premier Service Co., Inc.	1201 15th St # B	Tuscaloosa	100	Wholesale Trade - Durable Goods
Sears Roebuck & Co.	1701 McFarland Blvd E # 207	Tuscaloosa	100	General Merchandise Stores
Tuscaloosa Toyota	2502 Skyland Blvd E	Tuscaloosa	100	Gasoline Service Stations and Automotive Dealers
Valley Foods	1700 University Blvd E	Tuscaloosa	100	Food Stores

Source: Tuscaloosa County Chamber of Commerce, 2014

Income and Housing

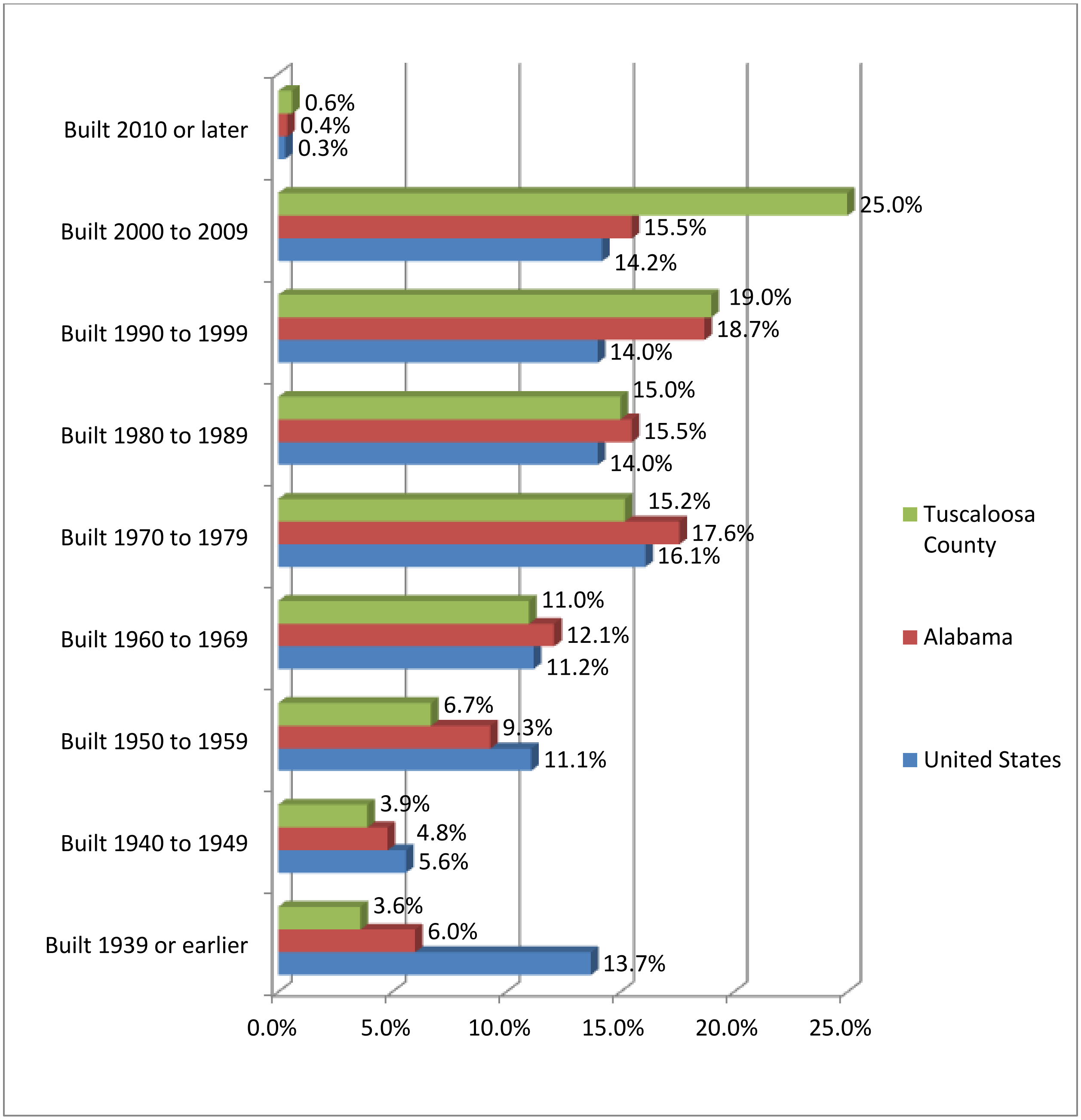
Approximately 19.2% percent of families live below the poverty line, which affects the value of housing units. The majority of owner-occupied housing values fall within the $100,000 to $199,999 range, at 42.9%. About 28% of housing units are valued at $99,999 or less, while 12% are valued at $300,000 or greater (see Chart 3-4). The median value for a home in Tuscaloosa County in 2012 (Census estimate) was $152,300. Chart 3-5 “Housing Stock by Age” shows that the majority of housing in Tuscaloosa County was constructed between 2000 and 2009, comprising 25% of the total housing stock. This percentage is higher than the state’s (15.5%) and the nation’s (14.2%) percentage. Approximately half of the housing stock was constructed between 1970 and 1999. This trend is similar to Alabama.

Chart 3-4. Housing Units by Value



Source: U.S. Census Bureau, 2008-2012 American Community Survey 5-year Estimates

Chart 3-5. Housing Stock by Age



Source: U.S. Census Bureau, 2008-2012 American Community Survey 5-year Estimates

3.9 Utilities

Electric Power

Alabama Power Company and Black Warrior Electric Membership Corporation provide electrical service for Tuscaloosa County and its jurisdictions.

Natural Gas

Natural gas for Tuscaloosa County and all of its jurisdictions are provided by the Northwest Alabama Gas District and Alagasco.

Water and Sewer

Water and sewer service for Tuscaloosa County and its jurisdictions are provided by Artesian Utilities System Management, Berry Water, Carrolls' Creek Water Authority, Citizens Water Service, City of Tuscaloosa Water and Sewer Department, Coaling Water Authority, Coker Water Authority, Fosters-Ralph Water Authority, Green Pond Water, Holman Water Authority, Hulls-Englewood Water, Mitchell Water System, Moundville Water, Northport Water Department, Oakman Water, Peterson Water System, Sand Springs Rural Water Authority, Town of Vance Sewer, and Warrior River Water. Tuscaloosa County operates a solid waste collection program and solid waste landfill and inert landfill.

3.10 Media

Television, Phone and Internet

Telecommunications services are provided by BellSouth and AT&T. This includes internet service, phone service, and cable television. Charter Communications and Comcast Cable also provide cable TV services for several jurisdictions. Sky Cable Vision provides cable TV for the Town of Woodstock. Tuscaloosa County has one independent television station, WVUA- Channel 7 and is served by four major network affiliated stations, ABC, NBC, CBS, and FOX.

Newspapers

Residents of Tuscaloosa County have access to the Tuscaloosa News, Moundville Times, and The Northport Gazette. The Crimson White newspaper, created by the University of Alabama, is also circulated. Residents can also receive the Huntsville Times, the Gadsden Times, and the Birmingham News.

Radio

Local radio stations include: WKUA-FM 88.5 – Moundville, WMFT-FM 88.9 – Tuscaloosa, WVUA-FM 90.7 – Tuscaloosa, WUAL-FM 91.5 – Tuscaloosa, WTUG-FM 92.9 – Northport, WFFN-FM 95.3 – Coaling, WMXB-FM 96.9 – Tuscaloosa, WTBC-FM 100.1 – Tuscaloosa, WMHZ-FM 100.9 – Tuscaloosa, WJRD-FM 102.1 – Tuscaloosa, WTUS-FM 103.3 – Tuscaloosa, WALJ-FM 105.1 – Northport, WRTR-FM 105.9 – Brookwood, WMHZ-FM 106.3 – Tuscaloosa, WGIB-FM 107.9 – Tuscaloosa, WTSK-AM 790 – Tuscaloosa, WJRD-AM 1150 – Tuscaloosa, WTBC-AM 1230 – Tuscaloosa, WMXB-AM 1280 – Tuscaloosa, WMHZ-AM 1340 – Holt, and WACT-AM 1420 – Tuscaloosa. Residents also may be able to tune into Birmingham radio stations.

3.11 Transportation

Major Roadways

Tuscaloosa County is served by Interstate 59/20 extending from the northeast to the southwest, with 12 exits into various portions of the county and Interstate 359. Major highways in the county include U.S. Highways 82, 11, and 43 and five state highways: 69, 5, 216, 69, and 171. Access to Interstate 459 can be obtained via I-59/20. See Map 3-7.

Railway and Transit

Kansas City Southern and Norfolk Southern provide rail service to the county. Amtrak provides passenger service on the Crescent Route – which links New York City to New Orleans. See Map 3-7. Tuscaloosa provides bus service via the Tuscaloosa Trolley and Greyhound service is also available (not shown on map).

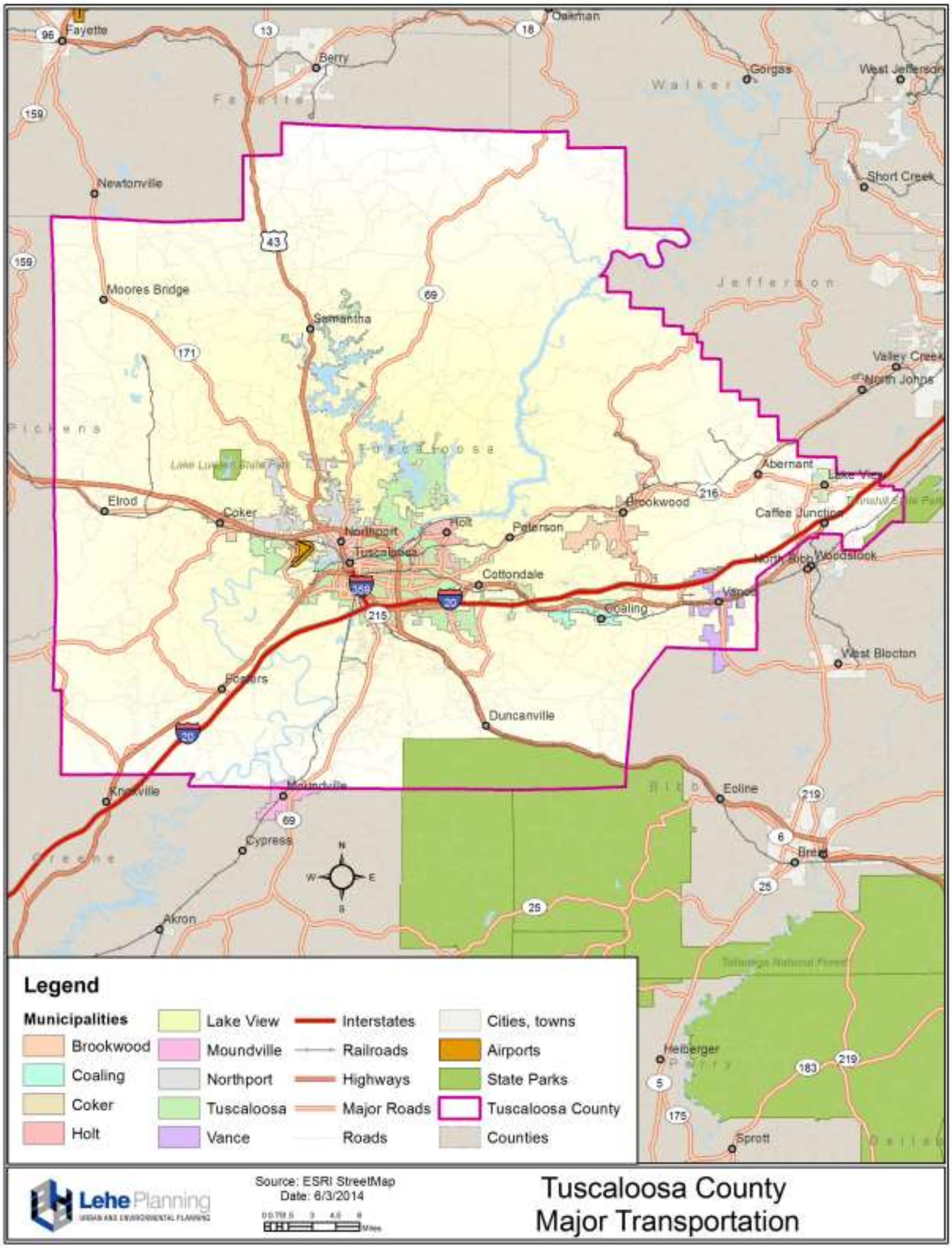
Airports and Heliports

The Tuscaloosa Regional Airport (TCL) and Van deGraaff Field has 6,500 feet of runway and handles air freight and private air traffic. Commercial air service is provided in Birmingham, less than an hour away. See Map 3-7.

Waterways

The Black Warrior River flows through Tuscaloosa County, connecting the county with the Port of Mobile via the Tennessee-Tombigbee Waterway. Parking Towing Company provides regional and local barge service and the Oliver Lock and Dam provide facilities for an eight-barge tow. See Map 3-7.

Map 3-7. Tuscaloosa County Transportation



Chapter 4 - The Planning Process

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

This chapter delineates the planning process that was used in the 2014 update of the hazard mitigation plan. The formatting of this part of the plan is different from the 2009 plan. Also new opportunities were provided for all to participate in the planning process through a new website and Twitter and Facebook accounts. There was more direct involvement and oversight by HMPC and the committee included new members.

4.3 Opportunities for Public Comment on the Plan

The Hazard Mitigation Planning Committee (HMPC) solicited public input into the mitigation plan through public meetings, the local news media, and an internet website tuscaloosa.hazardmitigationplan.com. Residents were encouraged to provide input through their representative on the Committee from each jurisdiction, and they were invited to attend committee meetings and provide their comments and concerns at those meetings. The plan on the website was continually updated and available for public review and comment throughout the planning process. The public could also send comments to the committee through Twitter, Facebook and email at tuscaloosa@hazardmitigationplan.com. The meeting materials, such as the agendas, PowerPoint presentations, committee exercises, and handouts were uploaded to the website and available for public viewing. (Refer to Appendix H "Community Involvement Documentation" for further explanation and documentation.)

Figure 4-1. Website Image

Between 5 PM and 7 PM on September 11, 2014, hundreds attended Tuscaloosa's very popular annual "Be Ready Day" at the site of the Old Fire College on McFarland Boulevard East in Tuscaloosa. The 2014 event included an open house in the auditorium of the Old Fire College where attendees could view the draft plan, fill out a survey on hazards, pick up public information handouts on hazard mitigation, and view maps and other exhibits placed on display. The EMA Director and the lead planning consultant were on hand to answer questions. The public was made aware of the meeting through notices broadcast on local media and newspaper reports. The local newspaper and radio and TV stations covered the event. Copies of the survey form, sign in sheets and the newspaper notice are included in Appendix H "Community Involvement Documentation."

Figure 4-2.Open House Participants

A second opportunity for comment at a public meeting was provided by all participating jurisdictions. As required by State law, each governing body held a public hearing to receive comments prior to adopting this Plan by resolution. The Tuscaloosa County EMA maintains copies of the resolutions, which have been submitted to FEMA through the Alabama EMA.

4.4 Opportunities for Involvement in the Planning Process

An email was 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 email is included in Appendix H. The GSA of Alabama provided additional information on geohazards that affect Tuscaloosa County for the update. Those agencies which received the notice are listed below.

Federal Agencies

- National Weather Service
- USDA Natural Conservation Service – Alabama District
- U.S. Army Corp of Engineers
- Federal Emergency Management Agency

State Agencies

- Alabama Emergency Management Agency
- Alabama Department of Economic and Community Affairs
- Alabama Department of Environmental Management
- Alabama Department of Transportation
- Alabama Forestry Commission
- Geological Survey of Alabama
- Alabama Historical Commission

Regional Agencies

- West Alabama Regional Commission

Neighboring Counties (represented by county EMA directors)

- Bibb County
- Fayette County
- Greene County
- Hale County
- Jefferson County
- Pickens County
- Walker County

Adjoining Municipalities, which lie partially within Tuscaloosa County

- Town of Woodstock (primarily in Bibb County)
- Town of Moundville (primarily in Hale County)

Academia

- Alabama Fire College

- Shelton State Community College
- Stillman College
- Tuscaloosa City Schools
- Tuscaloosa County School System
- University of Alabama

Non-Profits and Other Agencies

- West Alabama Chapter – American Red Cross
- DCH Regional Medical Center
- Northport Hospital Medical Center
- West Alabama Chamber of Commerce

4.5 Review and Incorporation of Applicable Plans and Documents

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

4.6 How the Plan was Prepared

The Hazard Mitigation Planning Committee (HMPC) held five committee meetings between April and October 2014. The kick-off meeting was conducted on April 14, 2014, and was held in the EMA offices of Tuscaloosa County. An introduction to hazard mitigation was made to ensure that all the participants understood what hazard mitigation is and to get the most out of the committee's efforts. The need for participation in the planning process was discussed and the new format of the plan was presented. An explanation of the regulatory authority that addresses the plan and the funding that is impacted through the use of the plan was provided. The planning process was mentioned and a review of drafts of chapters 1, 2 and 7 and appendices A and J was conducted. The HMPC participants were provided a copy of the Hazard Identification Exercise to complete and return to the planning team. A copy of the exercise is included in Appendix D.

The second meeting of the HMPC was held on June 26, 2014. The main topics were Chapter 3 and the beginning of Chapter 5. The committee members discussed the community profiles of their area and suggested changes to Chapter 3 which includes the demographics, major employers, transportation and utilities of the communities and the county. They also reviewed the beginning of Chapter 5 which covers hazard identification and risk. The committee discussed hazards that had occurred over the previous 5 year period; what their impact had been on their different jurisdictions and the possibility of them occurring again. They also reviewed appendices D and E. The planning team conducted an exercise with the group to illustrate how to perform project selection once funding becomes available.

On August 14, 2014, the third meeting was conducted. The second part of Chapter 5, “Vulnerability of Structures within each Jurisdiction” was reviewed. This section of the chapter discussed the different type of structures within each community and how much of an economic loss could occur depending on the type and severity of the hazard. It also covered the future land development and the affect it can have on mitigating the effects of a hazard event.

The meeting held on September 18, 2014 covered Chapter 4, “The Planning Process” and related Appendices G, H and I. This section of the meeting covered the process that was followed throughout the seven months the committee met to update the plan. Also covered during this meeting were Chapter 6, “Mitigation Strategies” and its related appendices. An explanation of the goals and objectives that should be considered while choosing strategies was discussed, as was an explanation of the value of thoroughly evaluating each measure the representative would like the jurisdiction to consider. Appendix B, “Community Mitigation Capabilities”, was reviewed to determine if the data on the capabilities for each jurisdiction was correct. Appendix C, “2009 Plan Implementation Status” was reviewed to help the members better understand and grasp the goals from the last plan update that had been achieved and those that had not. Appendix F, “Alternative Mitigation Measures” was presented so that the participants would be familiar with this vital tool when trying to mitigate different hazards. The “Multi-Jurisdiction Mitigation Action Program” exercise was provided to the members to begin creating the Community Action Programs for their communities. This exercise can be found in Appendix F – Alternative Mitigation Measures.

The final meeting was held on October 16, 2014. The committee came together to present their final contribution to the 2014 plan update. They discussed the second volume of the plan, Part II. Community Action Programs (CAPs). The planning team explained the significance of the individual programs and the responsibilities of the HMPC members to oversee the progress of their community’s plan. They also outlined the approval process, from the recommendation for approval from the AEMA to FEMA’s final approval. It was stressed that each community must adopt the plan in order for them to be considered for future mitigation funding and that they should all plan to meet at least once a year, as stated in Chapter 7, to revisit their CAPs and to encourage each other to continue to strive to meet their stated goals.

The Lehe Planning team assembled the final draft plan for submission to the Alabama Emergency Management Agency for FEMA review and approval, prior to local adoption. This final approved plan was adopted by resolutions of all participating jurisdictions at public hearings of their governing bodies.

4.7 Who was Involved in the Planning Process

4.7.1 The Hazard Mitigation Planning Committee

The 2014 Hazard Mitigation Planning Committee (HMPC) guided the development of this 2014 plan update. This committee is chaired by the current Director of the Tuscaloosa County EMA who invites participation from all jurisdictions and affected stakeholders and approves all appointments. The HMPC includes representatives from all the jurisdictions and stakeholders concerned with hazard mitigation and may be replaced periodically by the current chair. As a multi-jurisdictional agency, the Tuscaloosa EMA Director and Deputy Director represent the interests of all local jurisdictions.

The two school districts participate as both local government jurisdictions and as stakeholders within the jurisdictions they serve and have schools. The two school boards represent all schools and facilities within Tuscaloosa County.

Fire department representatives from the cities of Tuscaloosa and Northport also represented the Tuscaloosa County Fire Association, comprised of all municipal and rural fire districts and volunteer fire departments.

The towns of Moundville and Woodstock, which are only partially located in Tuscaloosa County, have chosen not to participate in this 2014 plan update. Instead, these towns intend to actively participate in the plans of the counties in which they are primarily situated. Moundville is primarily situated in Hale County, with just a small portion located in Tuscaloosa County, and, similarly, Woodstock is primarily located in Bibb County.

The names and titles/positions of the 2014 membership of the HMPC during the drafting phase of this plan and the types of representation, jurisdictions represented, and the agency/departments represented are listed in Table 4-1 “2014 HMPC Membership” on the following page:

Table 4-1. 2014 HMPC Membership

Name	Title or Position	Type	Jurisdiction/Organization	Agency/Department
David Hartin, Chair	Director	Jurisdiction	All	Tuscaloosa County EMA
Billy Green	Deputy Director	Jurisdiction	All	Tuscaloosa County EMA
John Powell Webb IV	Engineer	Jurisdiction	City of Northport	Engineering
Jason Norris	Battallion Chief/PIO	Jurisdiction	City of Northport	Fire
Scott Stephens	City Planner	Jurisdiction	City of Northport	Planning - Inspections
Joey Olive	Assistant Director	Jurisdiction	City of Northport	Public Works
Kevin Burgess	Training Chief	Jurisdiction	City of Tuscaloosa	Fire & Rescue
Jeff Motz	GIS Manager	Jurisdiction	City of Tuscaloosa	Information Technology
Scott Sanderford	Director	Jurisdiction	City of Tuscaloosa	Lakes Division
Josh Yates	Storm Drainage Engineer	Jurisdiction	City of Tuscaloosa	Office of the City Engineer
John McConnell	Director	Jurisdiction	City of Tuscaloosa	Planning and Development Services
Philip O'Leary	Deputy Director	Jurisdiction	City of Tuscaloosa	Planning and Development Services
Randy Vaughn	Captain	Jurisdiction	City of Tuscaloosa	Police
Jimmy Junkin	Director	Jurisdiction	City of Tuscaloosa	Water and Sewer
Duane Garner	Representative	Jurisdiction	Town of Brookwood	Volunteer
Daniel Wiggins	Director of Missions	Jurisdiction	Town of Brookwood	Town of Brookwood & VOAD
Gary Averett	Mayor	Jurisdiction	Town of Coaling	Office of the Mayor
Sylvia Rouse	Town Clerk	Jurisdiction	Town of Coaling	Office of the Town Clerk
Steve Hysaw	Council Representative	Jurisdiction	Town of Coker	Town Council
Bruce Wade	Mayor	Jurisdiction	Town of Lake View	Office of the Mayor
Joel Henderson	Building Inspector	Jurisdiction	Town of Vance	Building Inspections
Rod Coleman	Director	Jurisdiction	Tuscaloosa County	E911
Mike Henderson	County Engineer	Jurisdiction	Tuscaloosa County	Engineering
Dr. Mike Daria	Assistant Superintendent	Jurisdiction	Tuscaloosa City School District	General Administration
Jason Grady	Maintenance Foreman	Jurisdiction	Tuscaloosa County School System	Maintenance
David Sellers	Director	Jurisdiction	Tuscaloosa County School System	Operations and Construction
Don Hartley	Area Coordinator	Stakeholder	State of Alabama	AEMA
Tommy Dockery	EP Coordinator	Stakeholder	Tuscaloos County LEPC	Alabama Department of Public Health
Brad Lang	Work Unit Manager	Stakeholder	State of Alabama	Alabama Forestry Commission
Hank McKinley	NW Regional Forester	Stakeholder	State of Alabama	Alabama Forestry Commission
Alania Diaz	Representative	Stakeholder	American Red Cross	West Alabama Chapter ARC
Marcia McIntosh	Representative	Stakeholder	American Red Cross, Citizens Corps	West Alabama Chapter ARC and CC
Paul Abel	EP Coordinator	Stakeholder	DCH-Regional Health Systems	Emergency Preparedness Office
Sandy Ebersole	Geologist	Stakeholder	State of Alabama	Geological Survey of Alabama
Donald Keith	Director	Stakeholder	University of Alabama	Office of Emergency Preparedness
Ken Horst	Assistant Director	Stakeholder	University of Alabama	Office of Emergency Preparedness
Sarah Johnston	EP Manager	Stakeholder	University of Alabama	Office of Emergency Preparedness
Glenn Davis	Director of Training	Stakeholder	Tuscaloos County LEPC	West Alabama EMS

4.7.2 The Guidelines of the Hazard Mitigation Planning Committee

All local jurisdictions represented on the Hazard Mitigation Planning Committee (HMPC) met all of the following minimum participation guidelines:

1. Each jurisdiction had at least one active representative appointed to the HMPC. (Refer to above Table 4-1 "2014 HMPC Membership").
2. At least one jurisdiction representative attended all HMPC meetings, but In the event of extenuating circumstances, the local government sent a non-appointed proxy, if available to attend. In a few cases when a representative or alternate was unable to attend a meeting, all meeting materials (agendas, handouts, Power Point presentation, and committee exercises) were transmitted to the absent individual by email and through the project website at http://tuscaloosa.hazardmitigaitonplan.com. (Refer to Table I-1 "Multi-Jurisdictional Participation Activities" in Appendix I for participation records).
3. Each jurisdiction completed all interactive HMPC exercises. These are more than brief surveys; they are intensive interactive exercises, some of which were completed as group exercises. The actual exercises can be viewed in Appendix I "Multi-Jurisdictional Participation Activities," and the results, which are kept on file with the Tuscaloosa County EMA, are reflected throughout the contents of this plan.
4. In addition to the HMPC exercises, each jurisdiction cooperated in the capabilities survey. The results of that survey are documented in Table B-1 "Community Capabilities Assessment" in Appendix B "Community Mitigation Capabilities."
5. Each local government also cooperated with the Tuscaloosa County EMA during the development and finalization of the plan by providing the best available information necessary to complete the plan.
6. The HMPC members reviewed a list of alternative mitigation measures (refer to Appendix F "Alternative Mitigation Measures"). Each jurisdiction, including the two school boards and many of the stakeholders, prioritized mitigation measures recommended for inclusion in the Community Action Programs developed for each jurisdiction. The HMPC Exercise "Multi-Jurisdictional Mitigation Action Program Exercise," which can be found at the end of Appendix I, was used to facilitate the development of Community Action Programs by participants. Participants analyzed those mitigation measures under consideration and prioritized its preferred actions, taking into account, among other factors, the cost benefit of the measures and the hazard(s) to be mitigated.

4.7.3 Preparation of the Plan Update

This 2014 plan update was prepared under the direction of the Hazard Mitigation Planning Committee with the support of the Tuscaloosa County EMA. The Tuscaloosa County Commission retained the consulting firm of Lehe Planning, LLC to prepare the 2014 update. A professional urban planner, James E. Lehe, AICP, served as Plan Coordinator. A professional planner will continue to provide guidance and support to the Committee with any revisions, amendments, or updates to this Plan.

4.8 How the Public was involved in the Planning Process

The public was given many opportunities to participate in the plan update. The opportunities ranged from actively participating during committee meetings to offering comments through the internet and social media, as described here:

- All Hazard Mitigation Planning Committee meetings were announced and open to the public. Anyone interested in the planning process was welcome to attend. Meeting dates were posted on the plan website at tuscaloosa.hazardmitigationplan.com.
- The public was invited through various media announcements to attend the open house event during the Tuscaloosa "Be Ready Day" event held on September 11, 2014.
- The public was encouraged to participate via Twitter and Facebook or to email their comments to tuscaloosa@hazardmitigationplan.com .
- At the end of the planning process, the public was invited to attend public hearings held prior to plan adoption by each of the governing bodies, allowing individuals a final opportunity for public comment.

For more detailed documentation, including the sign-in sheet and survey, and additional discussion of public involvement, see Appendix H "Community Involvement Documentation."

4.9 The Plan Review and Update Process

The plan review and update process resulted in a comprehensive update of the 2009 plan elements, which was achieved through a process that involved the following tasks, among others:

- A complete rewrite of the 2009 plan, including new maps, charts, tables, and data.

- Addition of 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 status and effectiveness of mitigation actions adopted in the 2009 plan, which was reflected in the 2014 Community Action Programs for each jurisdiction.
- A reassessment of risks to include detailed research and analysis of hazards affecting the communities.
- New mapping of hazards and updates of hazard events.
- A complete inventory and mapping of critical facilities and infrastructure and assessment of vulnerabilities.
- The use of the HAZUS – MH to generate maps and reports for floods, earthquakes, and hurricanes.
- An examination of development trends and exposure to risks.
- A review and commitment to support the 2014 goals and objectives for hazard mitigation.
- Identification and analysis of a comprehensive range of mitigation alternatives.
- A prioritization of mitigation actions and projects and assignment of implementation responsibilities.
- Creation of Community Action Programs for each jurisdiction that reflect the results of the plan update.

More detailed descriptions of the updates and the scope of the 2014 plan update can be found in the beginning of each chapter.

Chapter 5 – Risk Assessment

5.1 Federal Requirements for Risk Assessments

This chapter addresses the Risk Assessment requirements of 44 CFR Section 201.6 (c) (2), as follows:

"201.6 (c) (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 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."

5.2 Summary of Plan Updates

The description of hazards in Section 5.3 have been reorganized so that lightning and hail fall under the severe storm category; the winter storm category includes freezes; the sinkhole category includes land subsidence; and the dam failures category does not include levees. Each hazard section is organized by a brief introduction, location and potential, extent and intensity, previous occurrences, and probability of future risk. These subsections also include a discussion of hazards that may occur as a result of other hazards.

5.3 Identification of Hazards Affecting Each Jurisdiction

5.3.1 Types of Hazards

The hazards affecting each Tuscaloosa County jurisdiction are listed in Table 5-1 "Identified Tuscaloosa County Hazards." The Town of Moundville, which lies primarily in Hale County, is covered by that county's plan, and the Town of Woodstock, which lies primarily within Bibb County, is covered by that county's ~~paln~~plan. This table also notes several hazards that may occur as consequences of other hazards. The Tuscaloosa County School Board and local fire protection districts and volunteer fire departments ~~Tuscaloosa County Fire Association~~ are included under the jurisdiction of Tuscaloosa County. Similarly, the City of Tuscaloosa School Board and the University of Alabama are included under the jurisdiction of the City of Tuscaloosa, with respect to identification of hazards, previous occurrences, and probability of future events. For example, hurricanes frequently spawn tornadoes. The 2009 Tuscaloosa County Natural Hazards Mitigation Plan includes a similar list of natural hazards, but the 2014 Tuscaloosa County Multi-Hazard Mitigation Plan identifies hazards that can occur as consequences of other hazards. Detailed descriptions of these hazards can be found in Appendix D, "Hazard Ratings and Descriptions."

Table 5-1. Identified Tuscaloosa County Hazards

Hazards	Associated Hazards	Jurisdictions Affected
Tornadoes	High Winds Severe Storms Lightning Hail	Tuscaloosa County Brookwood Coaling Coker Lake View Northport Guntersville Tuscaloosa Vance
Severe Storms	Thunderstorms Hail Lightning High Winds Tornadoes Floods Landslides Wildfires	Tuscaloosa County Brookwood Coaling Coker Lake View Northport Guntersville Tuscaloosa Vance
Floods	Landslides	Tuscaloosa County Brookwood Coaling Coker Lake View Northport Guntersville Tuscaloosa Vance
Hurricanes	Tropical Storms Tropical Depressions Severe Storms High Winds Floods Tornadoes	Tuscaloosa County Brookwood Coaling Coker Lake View Northport Guntersville Tuscaloosa Vance

Hazards	Associated Hazards	Jurisdictions Affected
Winter Storms/Freezes	Snow Storms Ice Storms Extreme Cold	Tuscaloosa County
		Brookwood
		Coaling
		Coker
		Lake View
		Northport
		Guntersville
		Tuscaloosa
		Vance
Droughts/Heat Waves	Extreme Heat Wildfires Sinkholes	Tuscaloosa County
		Brookwood
		Coaling
		Coker
		Lake View
		Northport
		Guntersville
		Tuscaloosa
		Vance
Wildfires		Tuscaloosa County
		Brookwood
		Coaling
		Coker
		Lake View
		Northport
		Guntersville
		Tuscaloosa
		Vance
Dam/Levee Failures	Floods	Tuscaloosa County
		Brookwood
		Coaling
		Coker
		Lake View
		Northport
		Guntersville
		Tuscaloosa
		Vance

Hazards	Associated Hazards	Jurisdictions Affected
Landslides	Mudslides	Tuscaloosa County
		Brookwood
		Coaling
		Coker
		Lake View
		Northport
		Guntersville
		Tuscaloosa
		Vance
Earthquakes	Landslides	Tuscaloosa County
		Brookwood
		Coaling
		Coker
		Lake View
		Northport
		Guntersville
		Tuscaloosa
		Vance
Sinkholes (Land Subsidence)		Tuscaloosa County
		Brookwood
		Coaling
		Coker
		Lake View
		Northport
		Guntersville
		Tuscaloosa
		Vance
Manmade and Technological Hazards		Tuscaloosa County
		Brookwood
		Coaling
		Coker
		Lake View
		Northport
		Guntersville
		Tuscaloosa
		Vance

5.3.2 Sources for Identifying Tuscaloosa County Hazards

The planning team used the following sources for identifying hazards in Tuscaloosa County:

1. HMPC Hazard Identification and Ratings Exercise. The Hazard Mitigation Planning Committee (HMPC) began the 2014 hazard identification process by reviewing and evaluating the list of hazards identified in the 2009 plan, which is reported in Appendix D "Hazard Ratings and Descriptions."

2. 2013 Alabama State Plan. The 2013 update of the State Plan served as an additional resource for identifying local hazards. The planning team compared the list of all of the hazards identified by the State against the local list of hazards and noted differences between the two lists. Table 5-2 compares the hazards identified in this 2011 plan update to those identified in the 2013 Alabama State Plan.

Table 5-2. Comparison of Identified Tuscaloosa County Hazards to 2013 State Plan

Hazards Identified in 2013 Alabama State Plan	Equivalent 2014 Tuscaloosa County Identified Hazards	Differences
Floods (storm surge, riverine, flash floods, etc.)	Floods	No storm surge or coastal floods in Tuscaloosa County inland location.
High Winds (hurricanes, tornadoes and windstorms)	Tornadoes – High Winds Severe Storms – High Winds Hurricanes – High Winds	High winds included as components of tornadoes, severe storms, and hurricanes in Tuscaloosa County plan.
Winter/Ice Storms	Winter Storms/Freezes	Tuscaloosa County plan identifies extreme cold as an associated hazard.
Landslides	Landslides	Tuscaloosa County plan identifies mudslides as an associated natural hazard.
Sinkholes and Land Subsidence	Sinkholes (Land Subsidence)	No difference.
Earthquakes	Earthquakes	Tuscaloosa County plan identifies landslides as an associated natural hazard.
Droughts	Droughts/Heat Waves	Included as a component of droughts/heat waves in Tuscaloosa County plan. Tuscaloosa County plan identifies sinkholes as a consequence of droughts/heat waves.
Hail	Severe Storms – Hail	Included as a component of severe storms in Tuscaloosa County plan.
Wildfires	Wildfires	Tuscaloosa County plan associates wildfires with droughts/heat waves.

Hazards Identified in 2013 Alabama State Plan	Equivalent 2014 Tuscaloosa County Identified Hazards	Differences
Extreme Temperatures	Droughts/Heat Waves – Extreme Heat Winter Storms/Freezes – Extreme Cold	Included as components of droughts/heat waves and winter storms/freezes in Tuscaloosa County plan.
Lightning	Severe Storms – Lightning	Included as a component of severe storms in Tuscaloosa County plan.
Dam/Levee Failures	Dam/Levee Failures	Tuscaloosa County plan associates floods with dam/levee failures.
Tsunamis	None	Tuscaloosa County is an inland location not subject to tsunamis.
Sea Level Rise	None	Tuscaloosa County is an inland location not subject to sea level rise.

3. List of Federally-Declared Disasters. Federal disaster declarations affecting Tuscaloosa County were an additional source for hazard identification. All declarations that have been issued between 1973 and 2012 are included in the following table.

Table 5-3. Summary of Federally-Declared Disasters 1961-2012

Disaster Number	Disaster Type	Date	Declaration Type*
109	Floods	02/27/1961	HM
280	Hurricane Camille	11/7/1969	HM
285	Heavy Rains, tornadoes, flooding	4/9/1970	HM
369	Tornadoes, flooding	3/27/1973	IA, PA-ABCDEFG, HM
388	Severe storms, flooding	7/3/1973	HM
422	Tornadoes	3/27/1973	IA, PA-ABCDEFG, HM
458	Severe storms, flooding	5/29/1973	IA, PA-ABCDEFG, HM
464	Severe storms, flooding	4/23/1975	HM
488	Severe storms, tornadoes, flooding	10/2/1975	HM
532	Severe storms, flooding	4/21/1977	HM
3045	Drought	7/20/1977	PA-AB
563	Severe storms, flooding	8/9/1978	HM
578	Severe storms, winds, flooding	4/18/1979	IA, PA-ABCDEFG, HM
598	Hurricane Frederic	9/13/1979	HM
619	Severe storms, tornadoes, flooding	4/20/1980	HM
638	Severe storms, tornadoes, flooding	4/10/1981	HM
639	Severe storms, flooding	5/14/1981	HM
695	Severe storms, flooding, tornadoes	12/13/1983	HM
742	Hurricane Elena	9/7/1985	HM
848	Severe storms, tornadoes	11/17/1989	HM

856	Flooding, severe storms, tornadoes	2/25/1990	IA, PA-ABCDEFG, HM
861	Flooding, severe storms, tornadoes	3/21/1990	HM
890	Flooding, severe storms	1/9/1991	HM
3096	Severe snowfall, winter storm	3/15/1993	PA-AB
1013	Winter storm, severe storms, freezing, flooding	3/3/1994	HM
1019	Severe storm, flooding, tornadoes	3/30/1994	HM
1034	Severe storms, flooding, Tropical Storm Alberto	7/8/1994	HM
1047	Severe storms, flooding, tornadoes	4/21/1995	HM
1070	Hurricane Opal	10/4/1995	HM
1104	Severe storms, flooding	4/22/1997	HM
1108	Storms, tornadoes, floods	3/20/1996	HM
1185	Severe storms, high winds, flooding	7/25/1997	HM
1208	Severe storms, flooding	3/9/1998	HM
1214	Severe storms, tornadoes	4/9/1998	IA, PA-ABDCDEFG, HM
1250	Hurricane Georges	9/30/1998	HM
1317	Winter Storm	2/18/2000	HM
1322	Severe storms, flooding	3/17/2000	IA, DH, IFG, SBA, HM
1352	Tornadoes	12/18/2000	IA, PA-AB, SBA, DFA, HM
1362	Severe storms, flooding	3/5/2001	PA-ABCDEFG, HM
1399	Severe storms, tornadoes	12/7/2001	HM
1438	Tropical Storm Isidore	10/9/2002	HM
1442	Severe storms, tornadoes	11/14/2002	IA, PA-ABCDEFG, DUA, DH
1466	Severe storms, tornadoes, flooding	5/12/2003	IA, DH, SBA, HM
1549	Hurricane Ivan	9/15/2004	IA, PA-ABCDEFG, HM
1593	Hurricane Dennis	7/10/2005	PA-ABDCEFG, HM
1605	Hurricane Katrina	8/29/2005	IA, PA-ABCDEFG, HM
3237	Hurricane Katrina evacuation	9/10/2005	PA-B
1687	Severe storms, tornadoes	3/3/2007	HM
3292	Hurricane Gustav	8/30/2008	PA-B
1789	Hurricane Gustav	9/10/2008	HM
1797	Hurricane Ike	9/26/2008	HM
1835	Severe storms, tornadoes, straight-line winds, flooding	4/28/2009	HM
1836	Severe storms, tornadoes, straight-line winds, flooding	5/8/2009	HM
1842	Severe storms, tornadoes, straight-line winds, flooding	6/3/2009	HM
1866	Tropical Storm Ida	12/22/2009	HM
1870	Severe storms, flooding	12/31/2009	HM
1908	Severe storms, tornadoes, straight-line winds, flooding	5/3/2010	HM
3319	Severe storms, tornadoes, straight-line winds	4/27/2011	PA-B
1971	Severe storms, tornadoes, straight-line winds, flooding	4/28/2011	IA,PA-ABCDEFG, HM
4052	Severe storms, tornadoes, straight-line winds, flooding	2/21/2012	HM
4082	Hurricane Isaac	9/21/2012	HM

*** Declaration 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 – Recreation
IFG – Individual and family grant	SA – Stafford Act
IHP - Individuals and households	403C – Department of Defense
SBA – Small Business Administration	

Source: FEMA, Region IV

4. Other Hazard Identification Sources. Other sources for identifying hazards included the following:
   - Tuscaloosa County EMA staff
   - Discussions with individuals serving on the HMPC
   - Local newspapers
   - National Weather Service records
   - NOAA Storm Events Database
   - Extensive internet research

5.4 Hazard Profiles

5.4.1 Tornadoes Profile

Source: okcstormwatcher.files.wordpress.com

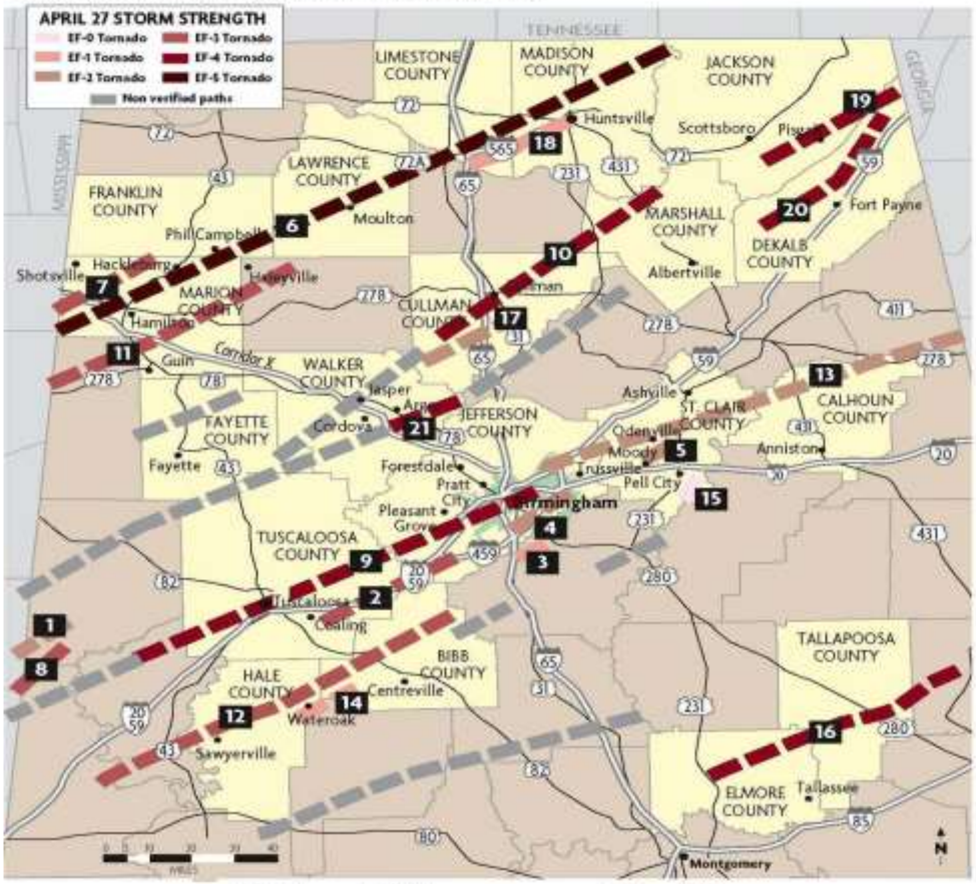
On April 27th, 2011, 29 confirmed tornadoes touched down in central Alabama (62 across the State), causing over a thousand injuries and 248 deaths within the state. Map 5-1 shows the paths and intensity of these tornadoes throughout the State of Alabama. Tuscaloosa County experienced particularly devastating tornadoes on this day. The tornado activity in Tuscaloosa County began with an EF-3 tornado that developed in Pickens County and traveled through Tuscaloosa County for 19 miles, crossing U.S. Highway 82. Another EF-3 tornado developed shortly thereafter in southeast Tuscaloosa County, near Coaling and moved to the northeast for 18 miles. Several homes and tress were damaged as the tornado touched down in Coaling. Later that afternoon, an EF-4 tornado moved through Pickens, Tuscaloosa, Fayette, Walker, and Blount counties, downing trees, destroying homes, tossing debris, injuring 54 people, and killing 13 people. The total tornado damage path was 127 miles long and the tornado was 1408 yards wide at its widest point in Tuscaloosa County.

However, the most violent and devastating tornado was yet to come. A mile-wide EF-4 tornado causing 1500 injuries and 65 deaths developed from a supercell thunderstorm that began in Mississippi. In initially touched down (in Alabama), in northern Greene County and moved through southern Tuscaloosa and western Jefferson Counties. This tornado (as shown in the following photo) destroyed several

buildings including the Tuscaloosa County Emergency Operations Center, restaurants, and stores. The Cedar Crest neighborhood was leveled, leading to at least 3 fatalities. As the tornado crossed University Boulevard, it completely destroyed Alberta Elementary School, a nearby apartment building, and the Alberta Park Shopping Center. Various cinder block homes, mobile homes, and apartment buildings were demolished, killing several more people. This was to-date the deadliest and costliest tornado in Central Alabama and Tuscaloosa County. More than 1,000 people were injured and 53 died, in Tuscaloosa County, as a result of the April 27 tornadoes.

Map 5-1. Tracks of the Tornadoes' Paths in Alabama on April 27, 2011

TRACKING THE TORNADOES' PATHS

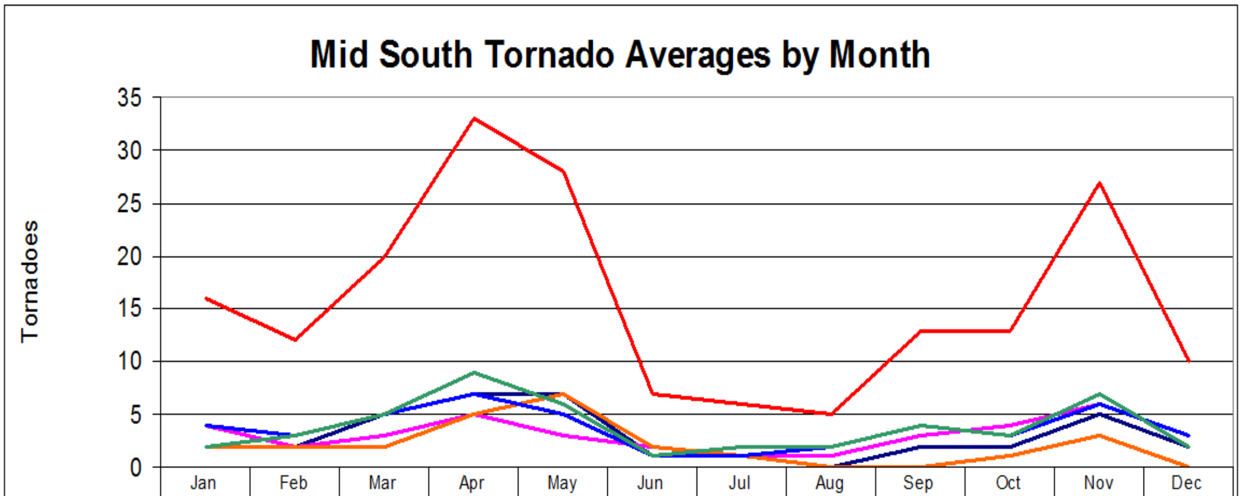


AREA (COUNTY)	Estimated peak winds	INJURIES/ FATALITIES	START TIME	END TIME	DAMAGE PATH	WIDTH
1. **Pickens County**	125 mph	Unknown	4:16 a.m.	*	3 miles	.8 mile
2. **Coaling** (Tuscaloosa./Jefferson)	155 mph	Unknown	5:17 a.m.	5:35 a.m.	18.3 miles	200 yds.
3. **Altadena** (Shelby/Jefferson)	100 mph	Unknown	5:50 a.m.	5:54 a.m.	3.4 miles	100 yards
4. **Cahaba Heights**	120 mph	Unknown	5:54 a.m.	6 a.m.	7.9 miles	200 yds.
5. **Odenville** (St. Clair)	120 mph	Unknown	6:14 a.m.	6:18 a.m.	3.9 miles	200 yds.
6. **Marion/ Franklin (Ala.) Lawrence/Limestone, Madison counties and Franklin,Tenn**	200+ mph	At least 26 fatalities	3:05 p.m.	*	132 miles	1.25 mile
7. **Shotsville** (Marion)	150-160 mph	At least 6 fatalities	3:57 p.m.	4:20 p.m.	19.1 miles	3/4 mile
8. **Sumter/Pickens counties**	140 mph	Unknown	3:57 p.m.	*	9 miles	1/2 mile
9. **Tuscaloosa/Birmingham**	190 mph	+1,000 injuries, 65 fatalities	4:43 p.m.	6:14 p.m.	80.3 miles	1.5 miles
10. **Walker/Cullman, Marshall and Morgan counties**	170 mph	Unknown	*	*	54 miles	3/4 mile
11. **Haleyville** (Marion/Winston)	150-160 mph	Unknown	5:10 p.m.	5:51 p.m.	31.8 miles	3/4 mile
12. **Sawyerville/Eoline** (Greene/Hale/Bibb)	145 mph	50 injuries, 7 fatalities	5:30 p.m.	6:55 p.m.	71.3 miles	1 mile
13. **Argo/Shoal Creek Ohatchee/Forney** (Jefferson/St. Clair Calhoun/Etowah/Cherokee)	150-160 mph	Unknown	6:23 p.m.	7:47 p.m.	72 miles	1.25 miles
14. **Wateroak** (Hale/Bibb)	105 mph	Unknown	6:50 p.m.	6:59 p.m.	5.5 miles	150 yards
15. **Pell City**	80 mph	Unknown	7:55 p.m.	7:59 p.m.	2.3 miles	50 yards
16. **Lake Martin** (Elmore/Tallapoosa Chambers counties)	170 mph	Several injuries, 9 fatalities	8:12 p.m.	9:09 p.m.	44.1 miles	1/2 mile
17. **Cullman County**	120 mph	Unknown	*	*	26 miles	1/2 mile
18. **Limestone, Madison counties**	90 mph	Unknown	*	*	3.8 miles	50 yards
19. **Jackson and DeKalb counties**	190 mph	11 deaths; unknown injuries	*	*	28 miles	1/2 mile
20. **DeKalb County**	175 mph	32 deaths; unknown injuries	*	*	33 miles	1/2 mile
21. **Walker/Blount, Cullman counties**	170 mph	7 fatalities	*	*	61 miles	1/4 mile

* Survey incomplete Source: National Weather Service, Alabama Emergency Management Agency, staff reports. NEWS STAFF

Tornadoes are rotating columns of air extending downward to the ground with recorded winds in excess of 300 miles per hour. They are highly localized events, most of which last for a short period of time and have a limited destruction path. In Alabama the peak tornado season extends from March through early June, with April and May being peak months for tornado activity. Additionally, Alabama experiences a secondary tornado season from September through November. Chart 5-1 depicts the monthly tornado frequency for the mid-south region.

Chart 5-1. Monthly Tornado Frequency, Mid-South Region



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AR	4	2	5	7	7	1	1	0	2	2	5	2
LA	4	2	3	5	3	2	1	1	3	4	6	3
TN	2	2	2	5	7	2	1	0	0	1	3	0
MS	4	3	5	7	5	1	1	2	4	3	6	3
AL	2	3	5	9	6	1	2	2	4	3	7	2
Region	16	12	20	33	28	7	6	5	13	13	27	10

Source: ustornadoes.com, 2013

Primary effects from tornadoes in Tuscaloosa County include:

- Loss of life;
- Property damage;
- Infrastructure destruction and damage; and
- Sanitation and water delivery interruption.

Hazardous results from significant tornadoes in Tuscaloosa County include:

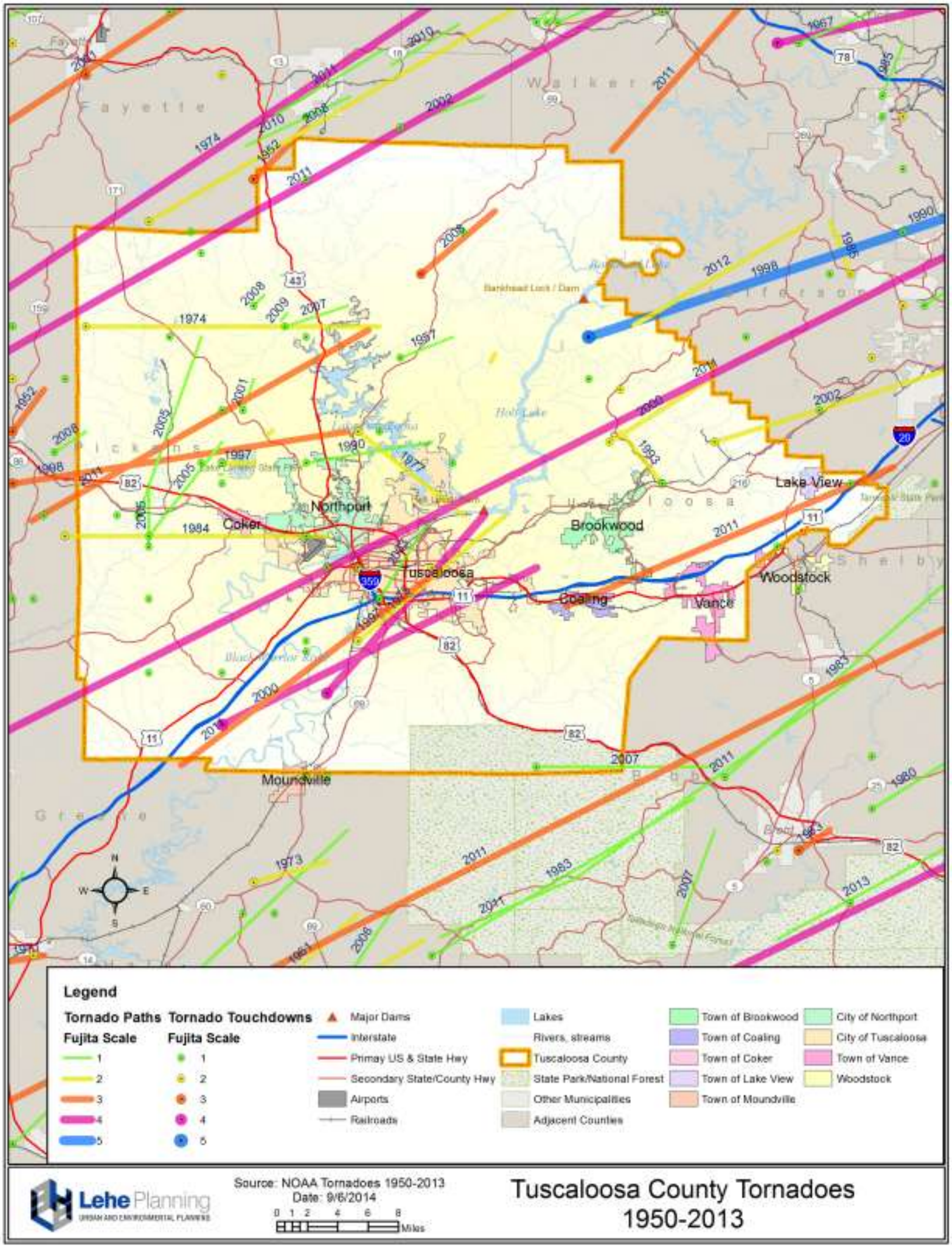
- Collapse of structures leaving people homeless.
- Blocked roadways, due to debris.
- Destruction of automobiles creating additional hardships to individuals, families, and business operations.

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

Location of Potential Tornadoes

All Tuscaloosa County locations are equally at risk for tornadoes. Map 5-2 "Tuscaloosa County Tornado Locations, 1950-2013," shows tornado tracks. Although many of the tornadoes appear to go straight through the City of Tuscaloosa, all jurisdictions in Tuscaloosa County are equally susceptible.

Map 5-2. Tuscaloosa County Tornado Locations, 1950-2013



Extent and Intensity of Potential Tornadoes

Tornadoes pose a significant threat to Tuscaloosa County communities. Refer to Appendix D "Hazard Ratings and Descriptions" to see how the Hazard Mitigation Planning Committee (HMPC) ranked tornadoes among all hazards in terms of exposure, risk and probability of future occurrences. In Tuscaloosa County, tornadoes occur on average, three times per year and can be devastating.

Tornadoes are now measured using the new enhanced Fujita Tornado Scale by examining the damage caused by the tornado after it passes over manmade structures and vegetation. The new scale was put into use in February of 2007. Table 5-4 (below) compares the estimated winds in the original F-scale and the operational EF-scale that is currently in use by the National Weather Service. Like the original scale there are six categories from zero to five that represent damage in increasing degrees.

Table 5-4. Comparison of F-Scale to EF-Scale

EF-Scale	Old F-Scale	Typical Damage
EF-0 (65-85 mph)	F0 (65-73 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)	F1 (73-112 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)	F2 (113-157 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)	F3 (158-206 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-Scale	Old F-Scale	Typical Damage
EF-4 (166-200 mph)	F4 (207-260 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)	F5 (261-318 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	F6-F12 (319 mph to speed of sound)	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

Source: NOAA Storm Prediction Center, 2014

Previous Occurrences of Tornadoes

Aside from the April 27, 2011 tornadoes which are the most damaging and deadly tornadoes to have ever occurred in Tuscaloosa County, the December 16, 2000 tornado also caused extensive damage. Rated as an EF-4 tornado, it caused the deaths of 11 people and injured over 100. The tornado touched down near the Black Warrior River around 1:00PM, spanned 750 yards wide and traveled for 18 miles. Homes were completely leveled, while significant damage to hotels, restaurants, and a shopping center were reported. Over 40 houses and 70 mobile homes were completely destroyed. This was considered one of the deadliest tornadoes to hit Alabama since the 1998 tornado that killed 32 people in Jefferson County.

According to the National Climatic Data Center (see Table E-1 in Appendix E "Hazard Profile Data"), Tuscaloosa County was the site of 44 tornado events between 1996 and 2013. These events caused 964 injuries, 56 deaths and damages of $1.5 billion—an average of 3.4 tornadoes and $118,659,615 in property damages per year. These figures are somewhat skewed due to the severe tornadic outbreak in 2005 and 2011.

Table 5-5. Annual Summary of Tornado Events, 1996-2013

Year	Tornadoes	Deaths	Injuries	Total Damages
1996	0	0	0	-
1997	2	1	11	$5,092,000
1998	3	0	2	$1,450,000
1999	0	0	0	-
2000	4	11	144	$12,580,000
2001	2	0	0	$26,000
2002	1	0	3	$300,000
2003	1	0	2	$100,000
2004	0	0	0	-
2005	11	0	2	$700,000
2006	2	0	0	$2,000
2007	2	0	0	$150,000
2008	4	0	0	$515,000
2009	3	0	0	$170,000
2010	0	0	0	-
2011	6	44	800	$1,521,490,000
2012	3	0	0	$0
2013	0	0	0	-
TOTAL	**44**	**56**	**964**	**$1,542,575,000**
AVERAGE	**3.4**	**4.3**	**74.2**	**$118,659,615**

Source: National Climatic Data Center, 2013

Probability of Future Tornado Events

Storm experts point out that tornadoes are unpredictable, which makes future risk difficult to determine. However, if historical trends continue, Tuscaloosa County can anticipate approximately 3 tornadoes per year. According to climatologists, the effect of climate change on tornadic activity is inconclusive. Jeff Trapp, a professor of atmospheric science at Purdue University indicates that, “while it's unclear how the intensity or frequency of tornadoes will increase, there may be more days featuring conditions ripe for twisters. We would see an increase in the number of days that could be favorable for severe thunderstorm and tornado formation. The tornado season, which varies by region, could be expanded".

5.4.2 Severe Storms Profile

A severe storm is a convective cloud that often produces heavy rain, wind gusts, thunder, lightning, and hail. Tuscaloosa County experiences many severe storms each year. The county is most susceptible to severe storms during the spring, summer, and late fall. Most of the damage caused by severe storms results from straight-line winds, lightning, flash flooding, and hail. Occasionally, severe storms will spawn tornadoes.

Primary effects from severe storms in Tuscaloosa County include:

- High Winds, Straight-line Winds;
- Lightning;
- Flooding;
- Hail; and
- Tornadoes.

Hazardous results from severe storms in Tuscaloosa County include:

- High winds that can cause downed trees and electrical lines, resulting in loss of power.
- Intense lightning that poses many threats to people and infrastructure and can ignite fires.
- Heavy rains which can produce severe storm water run-off in developed areas and cause bodies of water to breach their banks.
- Large hail capable of injuring people and livestock and damaging crops.
- Tornadoes that destroy anything in their path, resulting in loss of power, shelter, and potential loss of life.

Location of Potential Severe Storms

Severe storms lack geographic centers and boundaries, therefore cannot be substantively mapped. All areas of Tuscaloosa County have equal exposure to severe storms, including thunderstorms, high winds, heavy precipitation, and hail.

Extent and Intensity of Severe Storms

The extent of severe storms depends on severity and duration. A storm's severity is measured by the combination of rainfall, wind-speed, the size of any accompanying hail, and the intensity of lightning. The exact extent of severe storms is not predictable. Severe storms can also result in flooding due to heavy precipitation and wildfires due to lightning and will accompany hurricanes and tornadoes.

Large hail, though very rare, can cause injury or loss of life and major property damages, including crop damages. Normally, however, hail damage is limited to automobiles and minor building damage. Both lightning and high winds have the potential to cause loss of life and considerable property damage. The power of lightning's electrical charge and intense heat can electrocute on contact, split trees, and ignite fires. The most typical threat of high winds is power outages, which usually occurs when trees fall onto power lines, although they can cause severe damage to buildings and infrastructure.

Previous Occurrences of Severe Storms

A severe thunderstorm occurred on June 12, 2009 in Tuscaloosa County, carrying high winds, very heavy rain, dangerous lightning strikes, and nickel-size hail. On April 20, 2011, a severe thunderstorm with winds up to 74 mph occurred near the Tuscaloosa County Courthouse. It downed trees, power lines, and traffic lights. Thunderstorms occurring during 2004 and 2000 were the most costly, with \$1.8 million and \$1.4 million, respectively, in total damages.

Source: www.alabamawx.com

According to the National Climatic Data Center, 216 severe storms occurred in Tuscaloosa County between 1996 and 2013. There was an estimated \$5.5 million in total damages. Two deaths and nine injuries were reported during these severe storm events. Table 5-6 shows the details of thunderstorms for Tuscaloosa County during the seventeen-year study period. Table E-4 in Appendix E “Hazard Profile Data” lists the details of these storm events.

Table 5-6. Annual Summary of Severe Storm Events, 1996-2013

Year	T'storm Winds	Deaths	Injuries	Total Damages
1996	6	0	1	$318,000
1997	4	0	0	$23,000
1998	6	0	2	$195,000
1999	5	0	2	$18,000
2000	14	1	0	$1,386,000
2001	12	1	3	$297,000
2002	7	0	1	$229,000
2003	7	0	0	$122,000
2004	19	0	0	$1,835,000
2005	6	0	0	$195,000
2006	8	0	0	$43,000
2007	12	0	0	$95,000

Year	T'storm Winds	Deaths	Injuries	Total Damages
2008	15	0	0	$76,500
2009	33	0	0	$178,000
2010	19	0	0	$364,000
2011	22	0	0	$114,000
2012	18	0	0	$0
2013	3	0	0	$0
TOTAL	**216**	**2**	**9**	**$5,488,500**
AVERAGE	**12**	**0**	**0.5**	**$304,916**

Source: National Climatic Data Center, 2013

Probability of Future Severe Storm Events

It is certain that severe storms will show annual occurrences throughout all of Tuscaloosa County jurisdictions. However, not every storm will exhibit all the hazards associated with severe storms; high winds are less frequent, and large, damaging hail is rare.

5.4.3 Floods Profile

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

Tuscaloosa County has many rivers, streams, lakes and dams. The most catastrophic flooding in Tuscaloosa County has been caused by tropical systems such as tropical storms and slow- moving intense thunderstorms. There are hundreds of lakes in Tuscaloosa County, most of which were created by earthen dams. Each one of these dams can present a flood hazard. The Army Corps of Engineers in their 1978 study identified 13 dams in Tuscaloosa County as “potentially unsafe.” Alabama is the only state in the nation that does not have dam safety laws or provisions for state safety inspections of private dams. With significant rainfall, such as a tropical system, many dams in Tuscaloosa County could collapse or become damaged, causing widespread flooding (See Dam Failure Profile).

According to the Hazard Mitigation Planning Committee (see Appendix D “Hazard Ratings and Descriptions”), floods are a moderate concern to Tuscaloosa County communities. NOAA records affirm these public perceptions.

Primary effects from floods in Tuscaloosa County could potentially include:

- Loss of life;
- Property damage;
- Crop damage; and
- Dam and levee failure.

Hazardous results from significant flooding in Tuscaloosa County include:

- Rising water levels that can quickly sweep people along in its path.
- Rapidly moving water which can destroy anything in its path, leaving hazardous mold and breeding insects.
- Standing water which can kill inadaptable plants.
- Flowing water leading to removal of sediment and nutrients from the soil.
- Breached dams and levees allowing water to flood into the surrounding floodplain and resulting in destruction of crops and property.

Location of Potential Floods

Tuscaloosa County, in conjunction with FEMA, has identified Areas of Special Flood Hazard through its Flood Insurance Study, dated September 28, 2007. Building and construction standards have been implemented for these areas. Flooding is probable along the Black Warrior River and the areas surrounding the various lakes in the county. Developed municipal areas can experience flooding from storm water runoff during periods of heavy rain.

The Flood Insurance Rate Maps (FIRMs) of the National Flood Insurance Program (NFIP) indicates Tuscaloosa County has extensive areas located in the 100-year flood plain. Map 5-3 "Tuscaloosa County Flood Zones" shows that most of the flood zones reside in and around each of the county's jurisdictions, with a significant focus in and around the Sipsey River, Black Warrior River, and the City of Tuscaloosa.

Extent and Intensity of Potential Floods

The extent of each flood varies according to the amount of rainfall, the rate of storm water flow, and the capacity of the receiving channel to discharge flood waters. Tuscaloosa County experiences riverine flooding, primarily along local streams and tributaries of the Black Warrior River.

Previous Occurrences of Floods

The most recent flood event in Tuscaloosa County occurred in April 2014, whereby flooding from the Black Warrior River covered up low-lying areas along Jack Warner Parkway. While this event will be covered in more detail in the next plan update, the photo to the right shows the significant flooding over a walking bridge.

Source: www.al.com

Flood events that have occurred since the last plan update include two major rain events in early January and late February of 2009. These events resulted in significant riverine flooding and flash flooding of local streets and rural roadways. In each event, between 3-6 inches of rain fell over short periods. By the time the February rainfall hit, the Black Warrior River exceeded its flood stage (140 feet) by more than six feet, and the Holt Lock and Dam also exceeded its flood stage. Many roads were closed in the county including Commerce Drive, Harless, Old Jasper, Fosters Loop, Whitfield Bottom, River Bend, South Sandy and Maxwell Loop roads. Additionally, local street flooding in municipalities was common due to the strain on drainage systems.

National Climatic Data Center (NCDC) records (see Table E-7 in Appendix E) indicate that 43 floods have occurred in Tuscaloosa County from 1996 to 2013. Table 5-7 below shows that a total of $526,000 in damages has occurred, averaging at approximately $32K per year.

Table 5-7. Annual Summary of Flood Events, 1996-2013

Year	Floods	Deaths	Injuries	Total Damages
1996	2	0	0	$95,000
1997	1	0	0	$25,000
1998	3	0	0	$84,000
1999	1	0	0	$5,000
2000	1	0	0	$25,000
2001	0	0	0	-
2002	1	0	0	$50,000
2003	3	0	0	$10,000
2004	3	0	0	$21,000
2005	6	0	0	$39,000
2006	2	0	0	$0

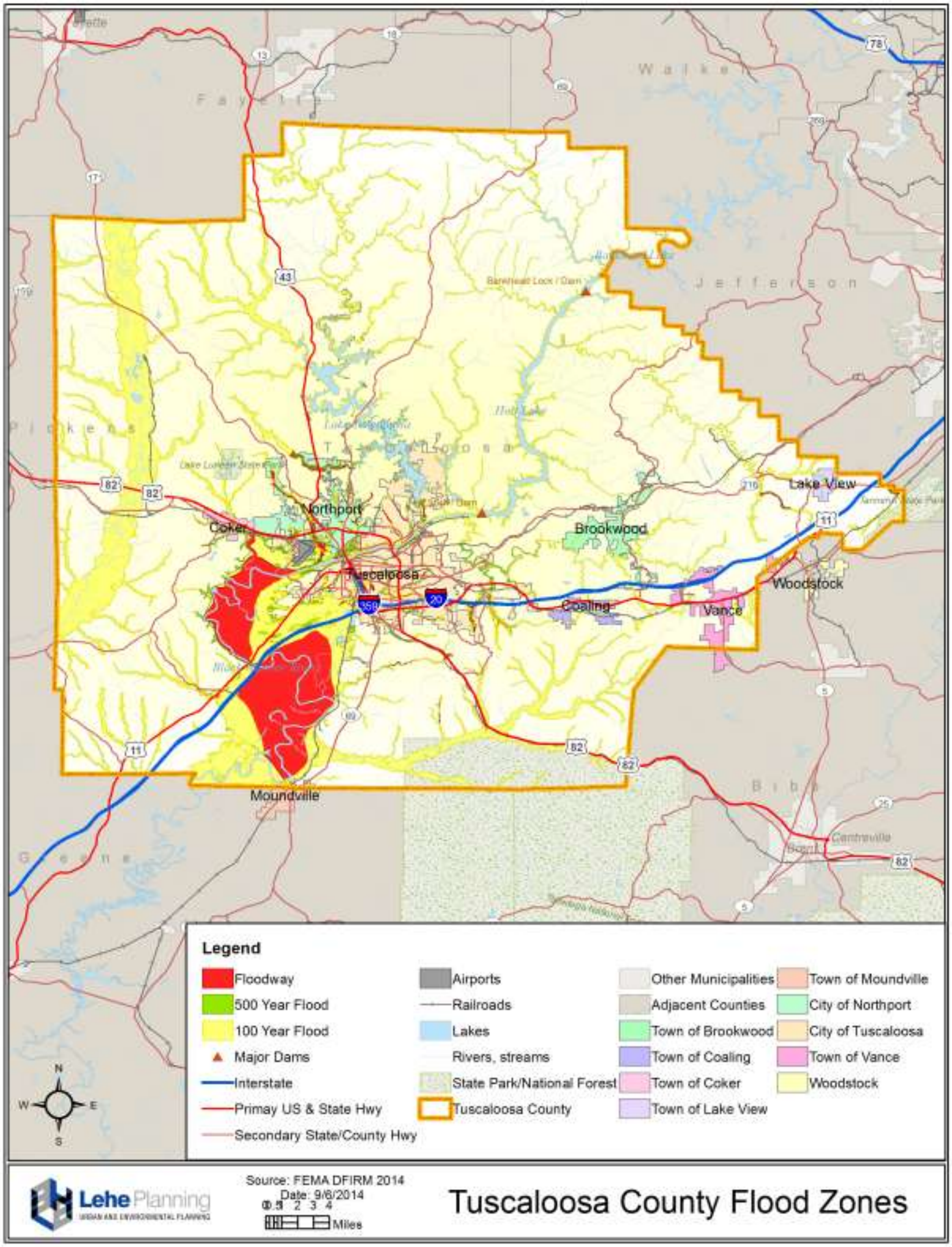
Year	Floods	Deaths	Injuries	Total Damages
2007	1	0	0	$0
2008	1	0	0	$0
2009	8	0	0	$37,000
2010	4	0	0	$135,000
2011	4	0	0	$0
2012	2	0	0	$0
2013	0	0	0	-
TOTAL	**43**	**0**	**0**	**$526,000**
AVERAGE	**2.69**	**0**	**0**	**$32,875**

Source: National Climatic Data Center, 2013

Probability of Future Flood Events

Past trends indicate that regular occurrences of heavy rainfall will continue to create flooding throughout Tuscaloosa County. Tuscaloosa County should expect approximately 2.7 flood events per year, although the severity of damage may vary widely from one year to the next. The occurrence of 100 and 500-year flood events are likely, with damages being potentially significant. 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 on floodplains, surface paving, quality of flood forecasting, settlement patterns, and warning systems.

Map 5-3. Tuscaloosa County Flood Zones



5.4.4 Droughts/Heat Waves Profile

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

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

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

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

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

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

Primary effects from droughts and heat waves in Tuscaloosa County include:

- Crop and other agricultural damage;
- Water supply shortage - water wells, creeks, rivers, and lakes dry up;
- Forest fires; and
- Heat exhaustion/heat stroke.

Hazardous results from significant droughts and heat waves in Tuscaloosa County include:

- Agricultural damage resulting in economic losses of crops and livestock.
- A water supply shortage resulting in damage to the sewer system, a lack of hydroelectric power, and the necessity for water to be trucked into the area.
- Forest fires that can devastate vast acreages, burning homes and businesses.
- Heat exhaustion which can be debilitating and result in a hospital stay and/or heat stroke which can cause death.

Location of Potential Droughts/Heat Waves

Droughts and heat waves affect all areas and jurisdictions of Tuscaloosa County equally. Certain areas, such as agricultural areas and areas with vulnerable water supplies, may be more susceptible to the adverse effects of droughts.

Extent and Intensity of Potential Droughts/Heat Waves

Typically, Tuscaloosa County droughts and extreme heat events do not carry reported damages. There are no injuries or deaths on record, according to the NCDC. The highest recorded temperature of 107°F occurred on July 24, 1952.

Previous Occurrences of Droughts/Heat Waves

Alabama experienced the worst drought it has ever seen in 2007. With drought conditions carrying over from 2006 (at a deficit of 12 inches of rain), 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. West-central Alabama reported a rainfall deficit that reached nearly 30 inches by 2007 and Tuscaloosa County experienced rainfall levels 18.33 inches below normal (NWS). Impacts were felt by farmers of all crops, including timber, livestock producers, and the forestry service. Additionally, electricity providers were affected as river and lake levels dropped and some municipalities were forced to place restrictions on water consumption as supplies became strained. State Agriculture Commissioner Ron Sparks referred to this event as the worst drought in 30-40 years.

According to the National Climatic Data Center (NCDC) records, there have been 23 droughts and 20 extreme heat events in Tuscaloosa County between 1996 and 2013 (Tables 5-8 & 5-9). During the extreme heat event of 2007, one person died and 50 were injured, tallying up $125,000 in damages. These events are recorded in Tables E-11 &12 in Appendix E “Hazard Profile Data.”

Table 5-8. Annual Summary of Drought Events, 1996-2013

Year	Droughts	Deaths	Injuries	Total Damages
1996-2005	0	0	0	-
2006	3	0	0	$0
2007	10	0	0	$0
2008	8	0	0	$0
2009-2010	0	0	0	-
2011	2	0	0	$0
2012-2013	0	0	0	-
TOTAL	**23**	**0**	**0**	**$0**
AVERAGE	**5.75**	**0**	**0**	**$0**

Source: National Climatic Data Center, 2013

Table 5-9. Annual Summary of Extreme Heat Events, 1996-2013

Year	Extreme Heat	Deaths	Injuries	Total Damages
1996	6	0	0	$0
1997	2	0	0	$0
1998-2001	0	0	0	-
2002	1	0	0	$0
2003	3	0	0	$0
2004-2006	0	0	0	-
2007	1	1	50	$0
2008-2009	0	0	0	-
2010	1	0	0	$125,000
2011	0	0	0	-
2012	5	0	0	$0
2013	1	0	0	$0
TOTAL	**20**	**1**	**50**	**$0**
AVERAGE	**2.5**	**0.1**	**6.25**	**$125,000**

Source: National Climatic Data Center, 2013

Probability of Future Drought/Heat Wave Events

Tuscaloosa County is susceptible to droughts and heat waves. There is not a significant historical record of droughts and heat waves, with the exception of the severe droughts occurring in 2007 and 2008. 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".

5.4.5 Winter Storms/Freezes Profile

What most called the worst winter storm in Alabama history struck Friday afternoon, January 27, 2000 and lasted until mid-day Saturday, January 28th. Snow began falling over north Alabama Friday afternoon and spread southward overnight to the Gulf Coast. The storm was caused by a strong and massive low-pressure system that moved from the western Gulf of Mexico into the Florida panhandle, and up the Eastern Seaboard. The heaviest snow began after midnight when northerly winds of 40 to 55 mph became common. Frequent lightning discharges occurred for several hours giving an eerie blue-tinged glow to the atmosphere. By mid-day Saturday, snow had accumulated to 6 to 12 inches over North Alabama and 2 to 4 inches at the Gulf Coast. A 40-mile-wide band of 12 to 20 inches fell from the Birmingham area northeastward to DeKalb and Cherokee counties, generally following the Appalachian Mountains.

High winds combined with the heavy wet snow felled numerous trees and knocked down power lines over a wide area. Numerous roads became impassable, and hundreds of thousands of homes were without power. It was estimated that 400,000 homes were without electricity, and many remained so for several days. Temperatures fell well into the single digits and teens across much of the state Saturday night. The Birmingham Airport temperature fell to 2 degrees, the coldest January temperature ever recorded. Some roads in north Alabama remained impassable until the following Tuesday. The snow and high winds knocked many radio and television stations off the air, and severely hampered emergency personnel responding to fires, stranded motorists, and those in dire need of medical attention. Many large trees fell onto homes and businesses and numerous awnings and roofs collapsed under the weight of the heavy snow.

There were at least 14 deaths associated with the exposure or stress from the storm. One person froze to death in their home. Six people died because of abandoned or disabled vehicles. Seven people died outside due to exposure. One of the seven died while waiting in a bus shelter for a bus. Most of the damage estimates were at least $50 million. Some estimates ranged between $80 and $100 million.

Primary effects from winter storms in Tuscaloosa County include:

- Injury and damage from downed trees and utility lines due to the snow and ice load;
- Widespread impassable roads and bridges;
- Disruption of services and response capabilities; and
- Crop and other agricultural damage.

Hazardous results from winter storms in Tuscaloosa County include:

- Loss of power, communications, and fires. Widespread power outages close businesses and impact hospitals, nursing homes, and adult and child care facilities serving special needs populations.
- Loss of transportation ability affecting emergency response, recovery, and supply of food and materials.
- Numerous vehicle accidents stretching thin the resources of fire, rescue and law enforcement.
- Food and housing shortages within the community, due to stranded motorists and the homeless.
- Strain on police, fire and medical providers due to the volume of calls for service.

Winter temperatures in Tuscaloosa County are generally moderate; the average temperature is 46.4° F and the average winter minimum is 35.6° F (Table 5-10). Extreme cold temperatures are rare for this area. These rare temperature lows can result in burst plumbing in homes and occasional deaths due to lack of sufficient heating or exposure. The lowest recorded temperature of -1° F occurred in 1977.

Table 5-10. Winter Weather Observations

Category	Observation
Average Winter Temperature	46.4° F
Average Winter Minimum Temperature	35.6° F
Lowest Temperature (January 19, 1977)	-1° F
Average Season Snowfall	0.6 inches
Largest Snowfall (February, 1960)	7.0 inches

Source: SE Regional Climate Center/National Climate and Data Center, 2012

Location of Potential Winter Storms/Freezes

All participating jurisdictions are equally likely to experience winter storms/freezes, which may be accompanied by snow, freezing rains, and extreme temperature lows.

Extent and Intensity of Winter Storms/Freezes

Tuscaloosa County experiences annual disruptions and some damages due to severe winter storms/freezes. The yearly average snowfall is 0.6 inches, but some events have produced major disruptions and damages. Winter temperatures on average are above freezing, but occasional freezes do occur.

Previous Occurrences of Winter Storms/Freezes

Tables 5-11 & 5-12 “Annual Summary of Winter Storm Damages & Extreme Cold Events and Damages” provide a summary of the available historical data from 1996 to 2013 for winter weather events in Tuscaloosa County from the National Climate and Data Center (NCDC). There have been five reported winter storms and two extreme cold events since 1996 (Refer to Table E-9 “Tuscaloosa County Snow and Ice Events, 1993-2013” and Table E-10 “Tuscaloosa County Extreme Cold Events, 1996-2013” in Appendix E).

The most recent recorded snow event was on February 12-13, 2014, spurring freezing rain, sleet, and ice accumulations up to a quarter of an inch in Tuscaloosa County. Self-reported snow measures (via social media) of up to an inch were reported throughout areas such as Brookwood and Vance. This winter storm, as well as the severe winter storm occurring in January 2014 will be discussed in more detail in the next plan update.

Table 5-11. Annual Summary of Winter Storm Damages, 1996-2013

Year	Winter Storm	Deaths	Injuries	Total Damages
1996	2	0	0	$21,000
1997	0	0	0	-
1998	1	0	0	$25,000
1999	0	0	0	-
2000	1	0	0	$25,000
2001-2010	0	0	0	-
2011	1	0	0	$0
2012-2013	0	0	0	-
TOTAL	**5**	0	0	**$71,000**
Annual Average	**1.25**	0	0	**$17,750**

Source: National Climatic Data Center, 2013

Table 5-12. Annual Summary of Extreme Cold Events and Damages, 1996-2013

Year	Extreme Cold	Deaths	Injuries	Total Damages
1996-2001	0	0	0	-
2002	1	0	0	$0
2003	1	0	0	$0
2004-2013	0	0	0	-
TOTAL	**2**	**0**	**0**	**$0**
Annual Average	**1**	**0**	**0**	**$0**

Source: National Climatic Data Center, 2013

Probability of Future Winter Storm/Freeze Events

Winter storms/freezes should continue to affect Tuscaloosa County on an annual basis, to some extent. However, the historical records cannot determine future outcomes; frequency of these events is totally unpredictable. The risks associated with the average annual hazard are slight, but the more infrequent, severe winter storms/freezes have potentially severe risks. These severe winter events can cause major transportation disruptions, lengthy power outages, substantial property damages, and some loss of life.

Map 5-4, which follows, shows the higher relative frequency of winter storms in North Alabama from 1993-2012 and indicates that Tuscaloosa County has approximately .59 to 1.11 winter storms per year. With an increase of moisture in the atmosphere, it is probable that precipitation will get heavier and under the right conditions could lead to heavier snowfall.

Map 5-4. Alabama Winter Storm Interval (1993-2012)

Source: State of Alabama Hazard Mitigation Plan, 2013

5.4.6 Hurricanes Profile

Hurricane season in the northern Atlantic Ocean, which affects the United States, begins on June 1 and ends on November 31. These months accompany warmer sea surface temperatures, which is a required element to produce the necessary environment for tropical cyclone/hurricane development.

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

Primary effects of hurricanes include storm surges which are defined as large volumes of ocean water that is driven onshore by a land-falling hurricane or tropical storm. Storm surges can increase mean water level by 15+ feet, if accompanied by tide. This is the leading cause of death in a hurricane. Wind is the secondary cause of death related to hurricanes. Wind continues to cause destruction as the storm travels miles inland and is able to completely destroy towns and structures. The winds near the eye of the storm are the strongest and most intense and can produce tornadoes. Heavy rains during hurricanes can easily exceed 15 to 20 inches and can cause flooding beyond coastal regions.

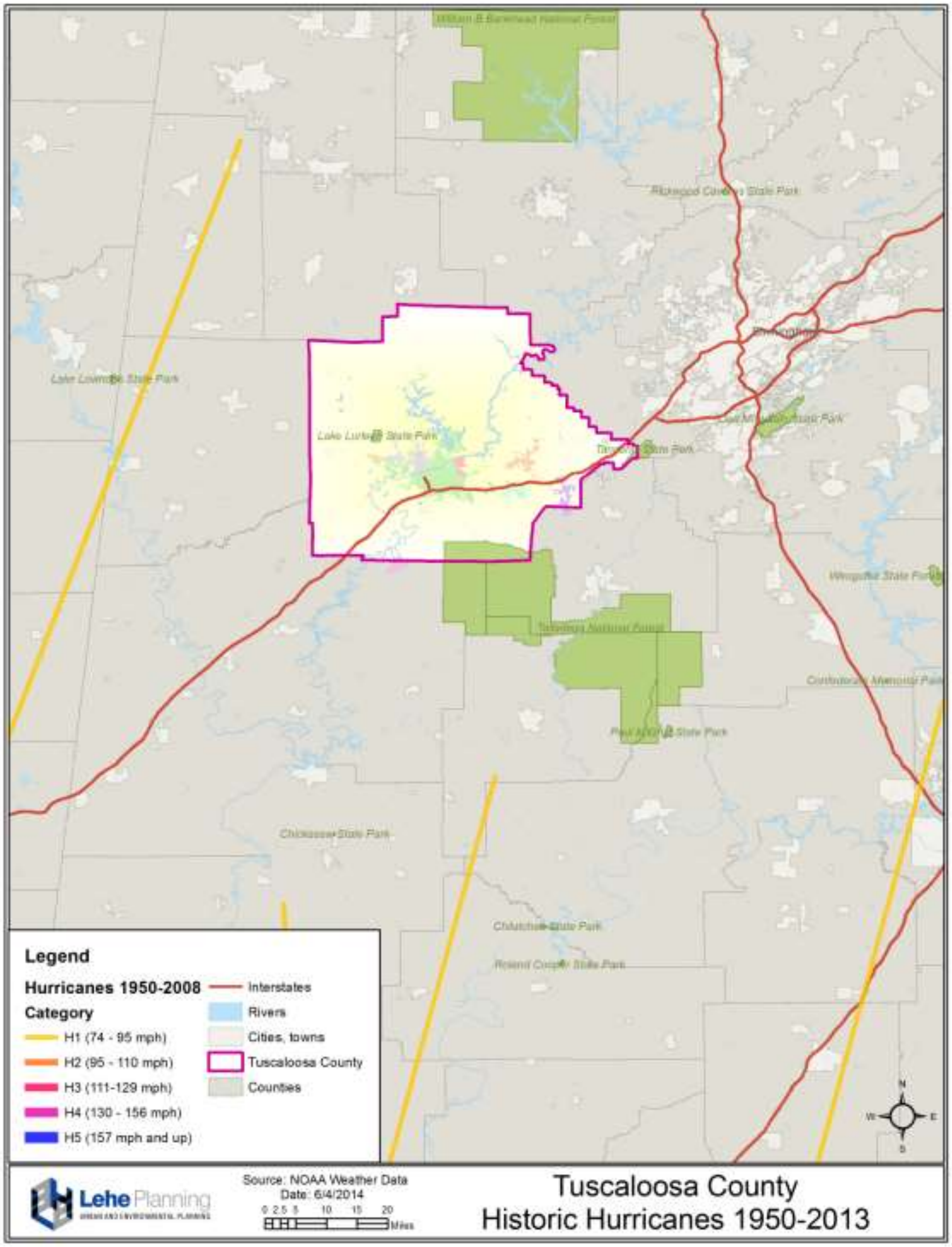
Secondary effects of hurricanes include tornadoes, which are usually found in the right-front quadrant of a storm or embedded in rain bands. Some hurricanes are capable of producing multiple twisters, but are usually not accompanied by hail or numerous lightning strikes. Tornado production can occur for days after the hurricane makes landfall and can develop at any time of the day or night during landfall. Inland flooding is another secondary effect of hurricanes. It is statistically responsible for the greatest number of fatalities over the last 30 years, related to hurricanes. The stronger storms are not necessarily the cause of most flooding; the weaker storms that move slowly across the landscape can deposit large amounts of rain causing significant flooding.

Location of Potential Hurricanes

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

Heavy rain fell quickly across the county causing flooding along the banks of creeks and streams. Map 5-5 shows the location of historic hurricanes in Tuscaloosa County.

Map 5-5. Historic Hurricanes in Tuscaloosa County, 1950-2013



Extent and Intensity of Potential Hurricanes

Hurricanes pose the greatest threat to life and property, but tropical depressions and storms can also cause extensive damage and loss of life. Inland hurricanes will dissipate by the time they reach Tuscaloosa County, which is located approximately 250 miles from the closest Gulf Coast landfall location. Should the hurricane path pass through or very near Tuscaloosa County, the hurricane would be downgraded to a tropical depression with thunderstorms and 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. Hurricanes can be accompanied by tropical storms, tropical depressions, severe storms, high winds, floods, and even tornadoes. The last recorded hurricane event for Tuscaloosa County was a tropical storm in 2005.

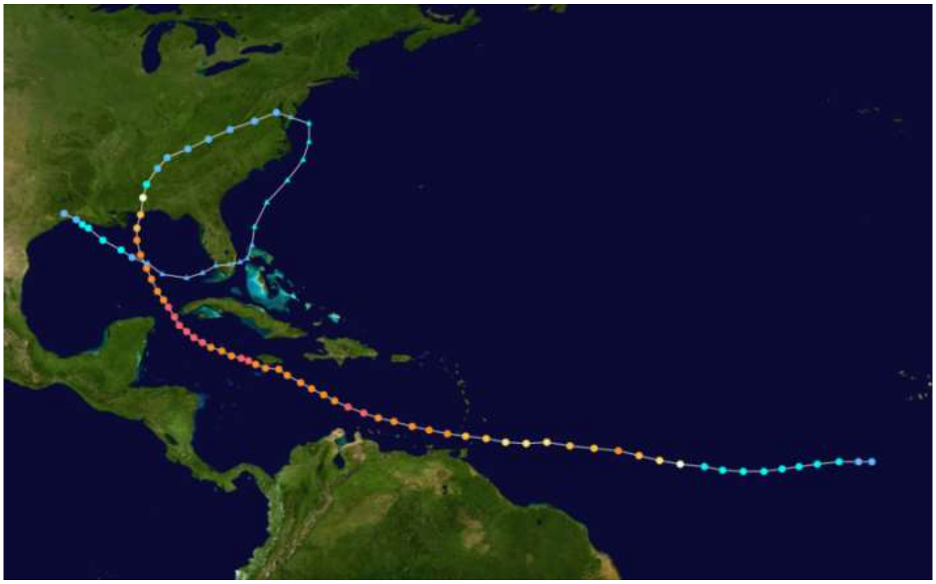
Previous Occurrences of Potential Hurricanes

Tuscaloosa County has been subject to twelve Federal disaster declarations for hurricanes occurring in Alabama. They include Camille (#280), Frederic (#598), Elena (#742), Opal (#1070), Ivan (#1549), Dennis (#1593), Katrina (#1605 & #3237), Gustav (#1789 & #3292), Ike (#1797), and Isaac (#4082). The following discusses a few of the more significant hurricanes.

Hurricane Ivan

Hurricane Ivan impacted southern Alabama from September 13-16, 2004, making landfall near Gulf Shores at approximately 10:00 a.m. on the 16th as a Category 3 hurricane (see Map 5-6 for hurricane track). Storm surge values of 10-14 feet along the Alabama and Florida coastlines were the highest observed in over 100 years. As the storm moved inland, high winds and heavy rains wreaked havoc across the state. Heavy rainfall, ranging between five and eight inches, caused minor flooding across various areas of the state. Hurricane force winds were experienced for two to four hours across all inland Alabama counties, causing major damage to trees. These fallen trees were determined to be the primary cause of all inland structural damage attributed to the storm and caused electricity to residents to be interrupted for a week or more. Alabama totaled an estimated $500,000,000 in damage to timber. Most of the soybean and pecan crops were destroyed, while the cotton crop suffered significantly though was not completely ruined.

Map 5-6. Hurricane Ivan Track



Source: National Hurricane Center

Hurricane Dennis

As a Category 3 hurricane, Dennis came ashore at Navarre Beach in the Florida Panhandle around 2:00 p.m. on July 10, 2005. Dennis brought with him sustained wind speed at 135 mph and estimated storm surges of 10-15 feet. The National Weather Service issued an inland hurricane warning, including all seven WARC counties, which indicated areas would experience substantial winds in excess of 74 mph with gusts up to 90 mph. The hurricane produced 5-10 inches of rain throughout Alabama. President Bush approved a disaster declaration to provide infrastructure assistance to governments in many counties across Alabama making them eligible to receive federal and state assistance to recover costs of debris removal operations and emergency protective measures. Tuscaloosa County was not included in this declaration. The county experienced fallen trees and power lines and assisted 31 evacuees displaced by this hurricane.

Hurricane Katrina

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

Map 5-7. Hurricane Katrina Track

Katrina had maximum sustained winds estimated to be 120 mph at landfall. As Katrina moved across land, the storm weakened, though it maintained hurricane status past Laurel, Mississippi. Southwestern Alabama experienced hurricane conditions as Katrina moved through neighboring Mississippi (shown on Map 5-7).

The effects of Katrina were widespread across Alabama, particularly areas in the western portions of the state. These effects included significant rainfall values totaling between 5 and 6 inches near the Mississippi state line and high winds with gusts recorded to be 68 mph out of Vance, Alabama. The rain and winds resulted in thousands of fallen trees and downed power lines. Power outages lasted from a few days to a week or more and Alabama Power reported Katrina to be the worst storm in their history for statewide damage and power outages. Additionally, minor damage occurred to some structures throughout the area. In Alabama, six tornadoes also stemmed from Katrina, four of which were F-0 and two that were F-1. Peak wind gusts in Tuscaloosa County reached 75 miles per hour.

Table 5-13 “Annual Summary of Hurricane Events, 1996-2013” provides a summary of the available historical data for hurricane events in Tuscaloosa County from the National Climate and Data Center (NCDC). There have been two reported hurricane or tropical storm events since 1996, totaling $5,700,000 in damages. Table E-8 in Appendix E “Hazard Profile Data” reports the hurricanes and tropical storms affecting Tuscaloosa County from 1996 – 2013.

Table 5-13. Annual Summary of Hurricane Events, 1996-2013

Year	Tropical Storms	Deaths	Injuries	Total Damages
1996-2004	0	0	0	-
2005	2	0	0	$5,700,000
2006-2013	0	0	0	-
TOTAL	**2**	**0**	**0**	**$5,700,000**
AVERAGE	**2**	**0**	**0**	**$2,850,000**

Source: National Climatic Data Center, 2013

Probability of Future Hurricane Events

As is the case with most natural hazards, past records are no guarantee of the probability of future hurricane events affecting Tuscaloosa County. Given its inland location within about 244 miles of the Gulf Coast, Tuscaloosa County can expect the remnants of frequent Gulf Coast hurricanes and occasional direct impacts of tropical depressions.

Climate changes affect future hurricane events in that 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 is likely due to warmer seawater and an increase of moisture in the atmosphere. Hurricanes most significant damage is cause by high winds and storm surges. 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.

5.4.7 Sinkholes (Land Subsidence) Profile

Source: americansforpurewater.wordpress.com

Sinkholes occur where limestone, carbonate rock, salt beds, or rocks that can naturally be dissolved by groundwater circulating through them exists below the surface of the ground. As the rock dissolves, spaces and caverns develop underground. The land usually stays intact until the underground spaces become too large to support the ground at the surface. When the ground loses its support, it will collapse, forming a sinkhole. Sinkholes can be small or so extreme they consume an automobile or a house. Certain activities can increase the potential for sinkholes in these areas, such as: periods of drought, excessive rainfall, well pump-age, and construction.

While most land subsidence is caused by natural dissolving of limestone over time, human activity can also trigger subsidence. Induced sinkholes can occur due to a drop in the water table or from construction. The latter explains the issue that occurs when sinkholes form from holes that develop in underground drainpipes. As water travels through the pipe, it sweeps dirt out from around the hole and causes the dirt from above the pipe to settle. Additionally, coal mining can increase the likelihood of sinkholes. Tuscaloosa County has been the site of coal mining efforts and the older mines, in particular, warrant consideration of sinkholes.

Location of Potential Sinkholes

Map 5-8 shows there are limestones and dolostones in the southeastern portion of Tuscaloosa County. Map 5-9 shows several sinkholes identified from USGS topographic maps.

Extent and Intensity of Potential Sinkholes

Coal mining conducted in portions of the county, along with failing underground drainpipes indicates that there is potential for sinkholes to occur. Mine subsidence occurs when an area overlying a mine, typically no more than 50 feet of vertical distance between the seam and the surface, collapses into the mine. The extent of the damage is usually localized. A mine sinkhole occurs most often with abandoned mines, as with active mines companies are required to perform at a depth sufficient enough to avoid subsidence.

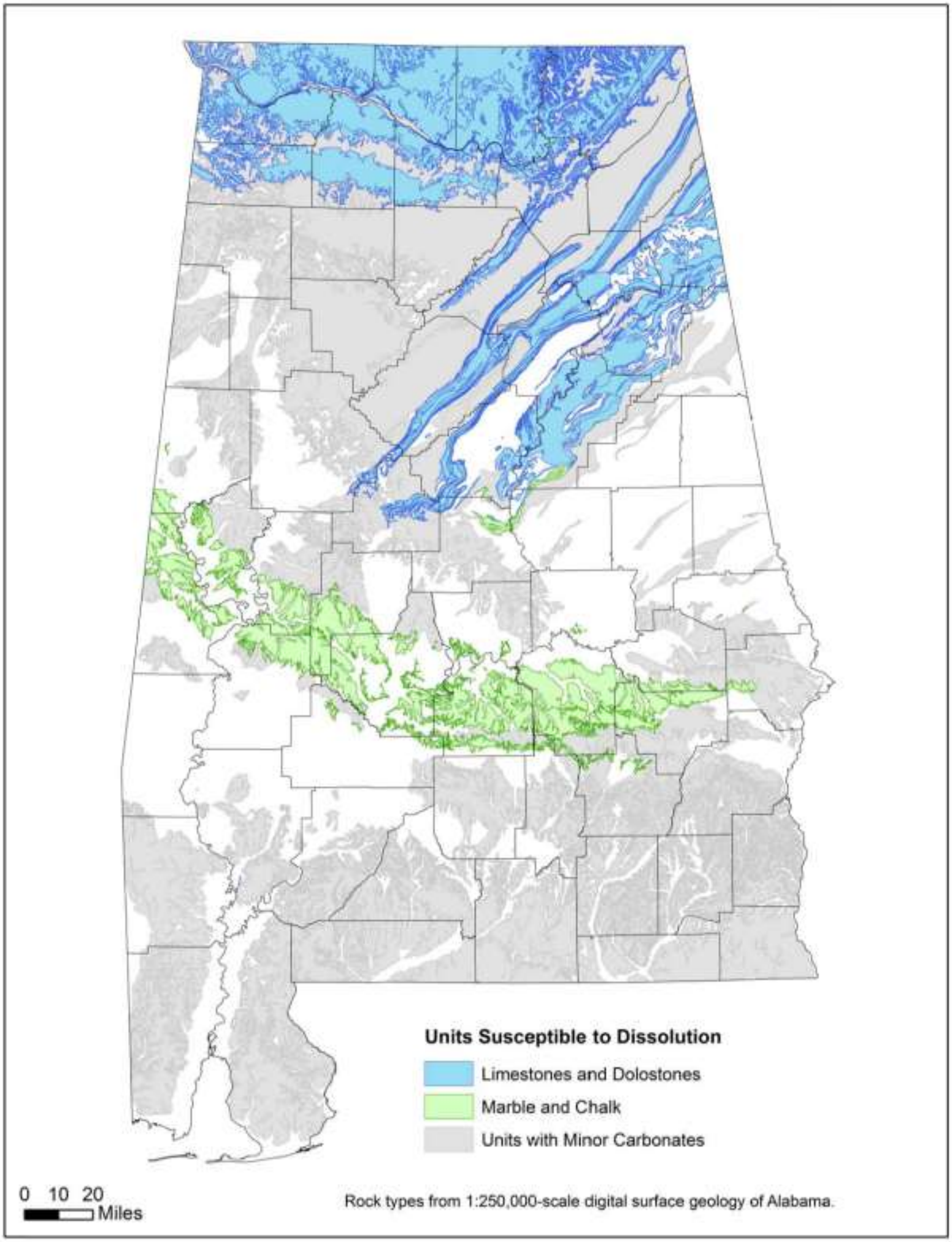
Previous Occurrences of Sinkholes

The Town of Brookwood has had incidences of sinkholes, as a result of mining activity. Filling the sinkholes has mitigated this issue. Data from the Geological Survey of Alabama (GSA) (based on historic USGS 1:24,000-scale topographic maps) counts over 6,400 sinkhole events in Alabama and according to a 2010 map of sinkhole activity, approximately 4 sinkholes have occurred in Tuscaloosa County. In March 2008, North River incurred two sinkholes as a result of failing underground drainpipes. There are no regulations requiring individuals to report developing sinkholes, but local and news reports provide further insight. To address this informational gap, the GSA is currently creating a new statewide inventory of sinkholes.

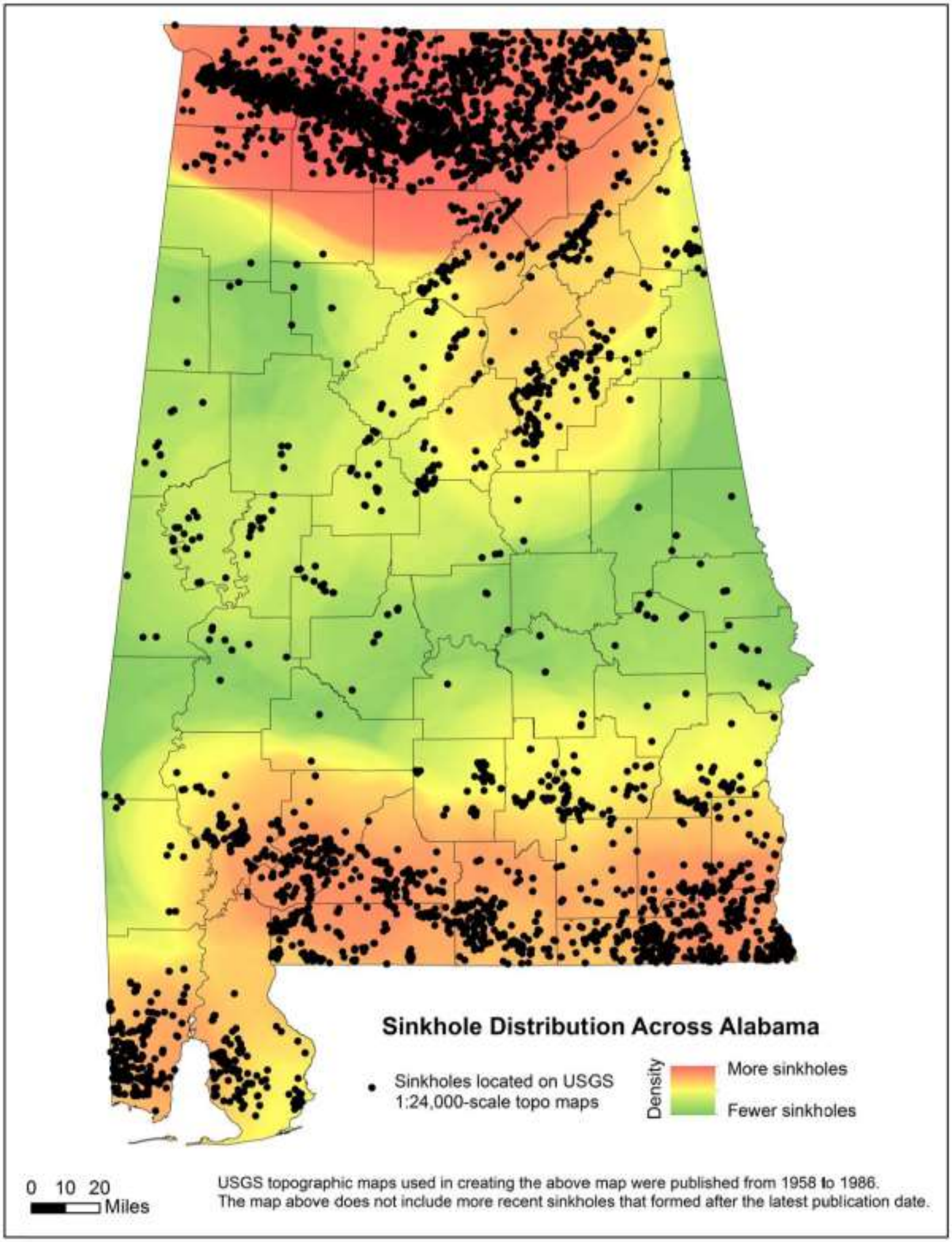
Probability of Future Sinkhole Events

Tuscaloosa County's history of sinkholes and its geological conditions conducive to sinkholes indicates that the probability of future sinkhole events is moderate for the county. Map 5-10 "Tuscaloosa County Sinkhole Susceptibility" shows that there are Karst regions in the eastern portion of Tuscaloosa County, extending from Coaling, Vance, and Lake View. It also shows approximately ten sinkholes in the county. In addition, ongoing data collection by the Geological Survey of Alabama might reveal unknown conditions that raise the likelihood of sinkholes within Tuscaloosa County.

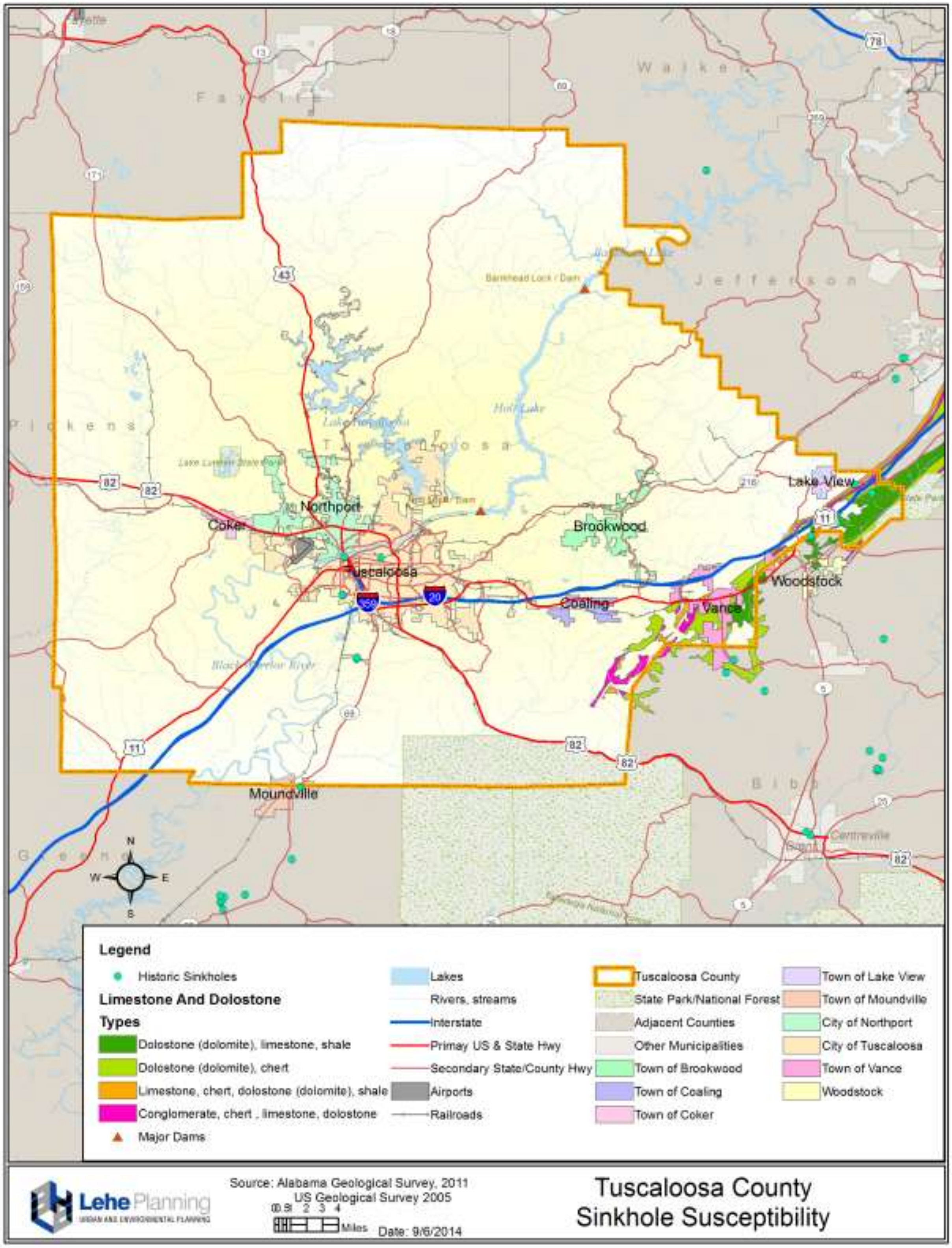
Map 5-8. Karst Geography, Alabama



Map 5-9. Alabama Sinkhole Density



Map 5-10. Tuscaloosa County Sinkhole Susceptibility



5.4.8 Landslides Profile

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

Primary effects from landslides in Tuscaloosa County include:

- Property damage;
- Impassable roads;
- Sediment erosion; and
- Underground infrastructure damage.

Hazardous results from landslides in Tuscaloosa County include:

- Force capable of destroying most structures in their path while carrying anything they come in contact with.
- Material that can damage and destroy roads, as well as block them with debris, resulting in disruption to business and other activity.
- Removed sediment which can leave the surrounding area bare and prone to erosion.
- Destruction and burial of underground pipes and wiring, creating a loss of services.

Location of Potential Landslides

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 incident and susceptibility shown on Map 5-11 “Tuscaloosa County Landslide Areas,” as follows:

1. Landslide susceptibility. Susceptibility is the probable degree of response to landslide triggers, that is, the response to cutting or excavation, loading of slopes, or to 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.
- No susceptibility indicated – 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.

Most of the jurisdictions in Tuscaloosa County (as identified in this plan) are in a have a low degree of susceptibility to landslides, as shown below in Map 5-11 “Tuscaloosa County Landslide Areas”.

Extent and Intensity of Potential Landslides

According to the GSA data, most of Tuscaloosa County is in an area of low landslide incidence, with a few areas of moderate susceptibility.

Previous Occurrences of Landslides

In a 1982 study performed by Karen F. Rheams of the United States Geological Survey, Tuscaloosa County was reported to have 41 of the 454 reported landslides in the State of Alabama. The report separated the landslides into natural and man-induced events such as those attributed to roadway construction. The 41 landslides in Tuscaloosa County were all man-induced events attributed to roadway construction, primarily along U.S. Highway 82. No natural landslides were reported in this study.

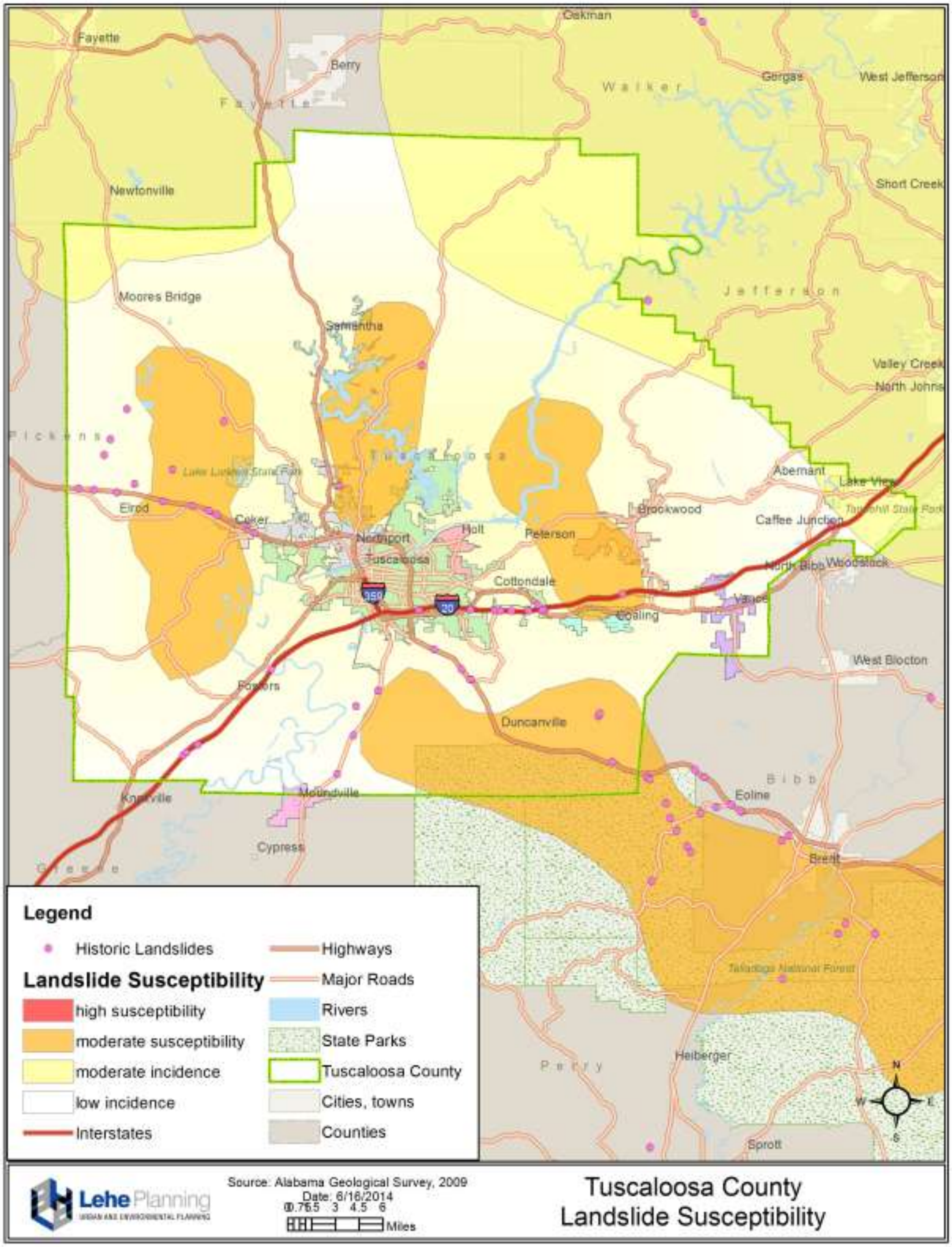
The following photo shows a landslide on a deforested slope, in which the underlying geology is the sand of the Cretaceous Coker Formation of the Tuscaloosa Group. National Climatic Data Center shows no records of landslides in Tuscaloosa County.

Source: USGS

Probability of Future Landslide Events

Based on minimal evidence of previous occurrences, the probability of future landslides is minimal for all jurisdictions in Tuscaloosa County. Any future landslides are likely to be the result of construction activities and will be commensurately minor in scope. The risk of landslides is low compared to other natural hazards in Tuscaloosa County.

Map 5-11. Tuscaloosa County Landslide Areas



5.4.9 Earthquakes Profile

An earthquake is a sudden slip on a fault and the resulting ground shaking and radiated seismic energy caused by the slip. The hazards associated with earthquakes include anything that can affect the lives of humans including surface faulting, ground shaking, landslides, liquefaction, tectonic deformation, tsunamis, and seiches. Earthquake risk is defined as the probability of damage and loss that would result if an earthquake caused by a particular fault were to occur.

Losses depend on several factors including the nature of building construction, population density, topography and soil conditions, and distance from the epicenter. Interestingly, an earthquake's magnitude can be a poor indicator of hazard impact because the duration of ground shaking and resulting increased damages, is not factored into the magnitude concept. While collapse of structures can be a great loss, collapse is caused mainly by large magnitude earthquakes, and earthquakes of this size are rare. For any given earthquake, few structures will actually collapse, but most damage will be associated with contents and nonstructural components. Structures built with more flexible materials, such as steel framing, are preferred. Wood frame construction, which constitutes a high percentage of homes in the United States, also tends to flex rather than collapse, but is more susceptible to fire.

Building codes have historically been utilized to address construction standards to mitigate damages for earthquakes and other hazards. However, older structures, non-compliance, and incomplete knowledge of needed measures remain a problem. In order to reduce losses to lives and property, wider adoption of improved construction methods for both residential and important critical facilities such as hospitals, schools, dams, and power, water, and sewer utilities is needed.

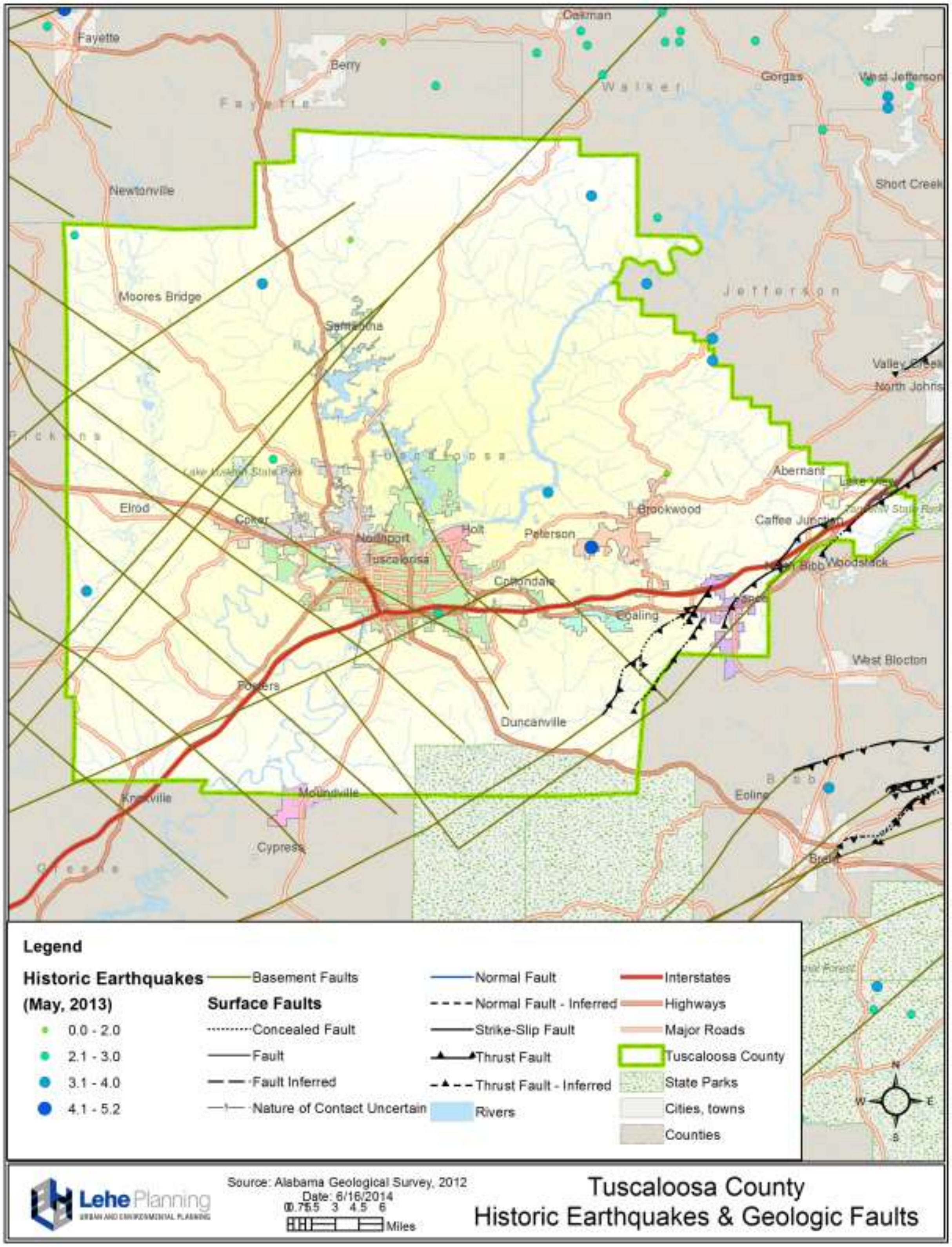
Location of Potential Earthquakes

When earthquakes strike a region, it is impossible to predict which area will be affected the most at a sub-county level. All of Tuscaloosa County has a very low to low degree of susceptibility to earthquakes, but the impacts can vary depending on the magnitude and epicenter location. The Alabama Geological Survey has identified two areas within Tuscaloosa County that could contain earthquake-producing faults. They are the Appalachian Fold and Thrust Fault in the southeastern part of the county and an unnamed fault in the Robinson's Bend area near Moundville.

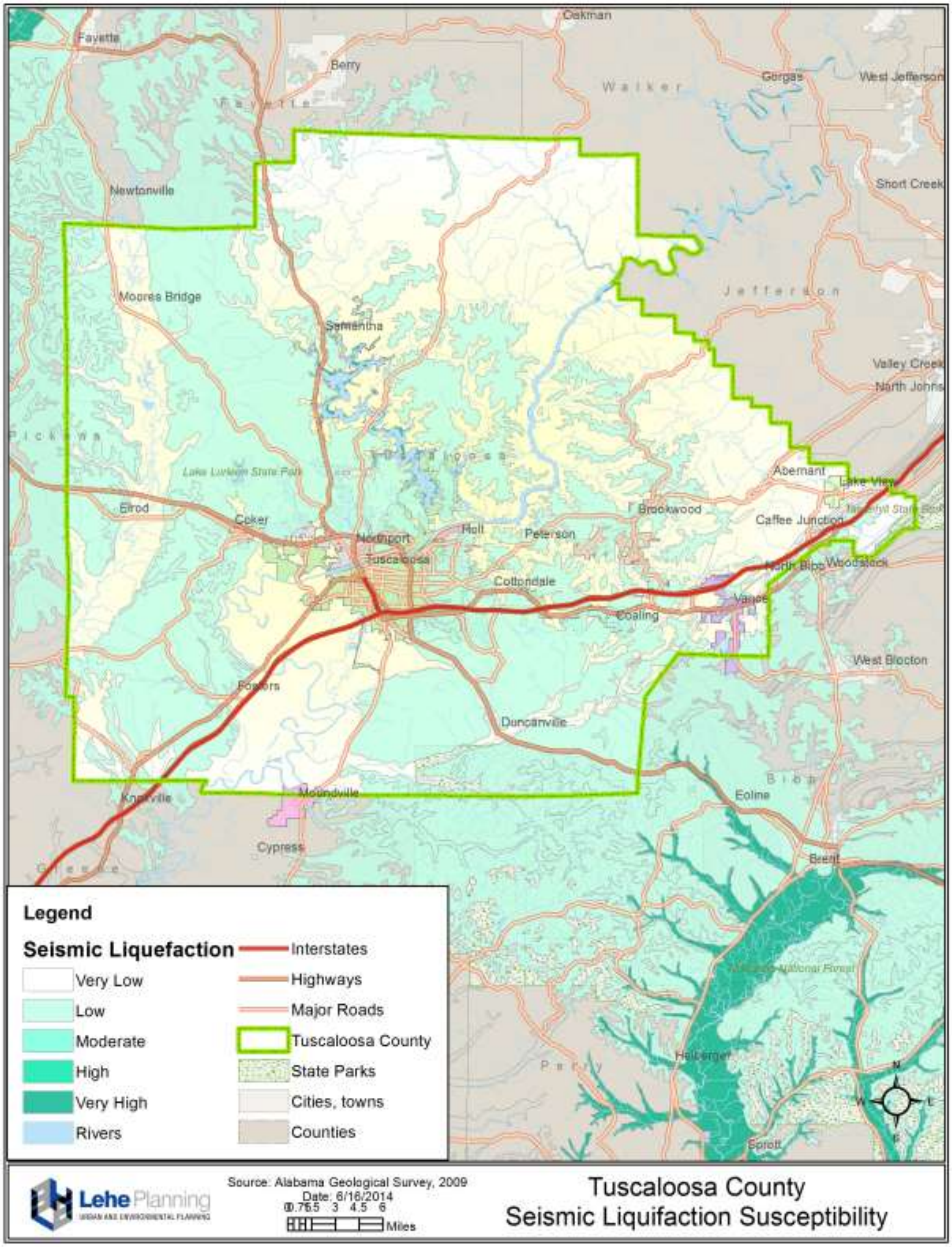
The following maps (Map 5-12 and 5-13), generated from 2011 GIS data supplied by the Geological Survey of Alabama (GSA), show historic earthquake locations and locational variations in soil liquefaction throughout Tuscaloosa County. Damages to buildings and infrastructure depend not only on the energy released during an earthquake, but also underlying soils and geological characteristics. For instance, structures built upon loose sediments of riverine floodplains along the Black Warrior

River are more likely to be damaged than structures built in higher elevations. Liquefaction is most likely to occur in soils with high water content within parts of these flood plains. Map 5-12 shows basement faults and surface fault lines, with thrust fault lines extending through Vance and Lake View and Map 5-13 indicates that the majority of Tuscaloosa County has low seismic liquefaction susceptibility.

Map 5-12. Tuscaloosa County Historic Earthquakes & Geologic Faults



Map 5-13. Tuscaloosa County Earthquake Liquefaction Potential



Extent and Intensity of Potential Earthquakes

According to the Geological Survey of Alabama (GSA), recent seismograph records indicate that earthquakes in the state are frequent, but not strong enough to be felt on the land surface. Earthquakes can occur anywhere in Alabama, but are unlikely to cause damage. As discussed in the “Earthquakes Description” included in Appendix D, the severity of an earthquake is measured on the Modified Mercalli Intensity Scale, which numbers earthquakes by energy released on a scale of 1 to 10.

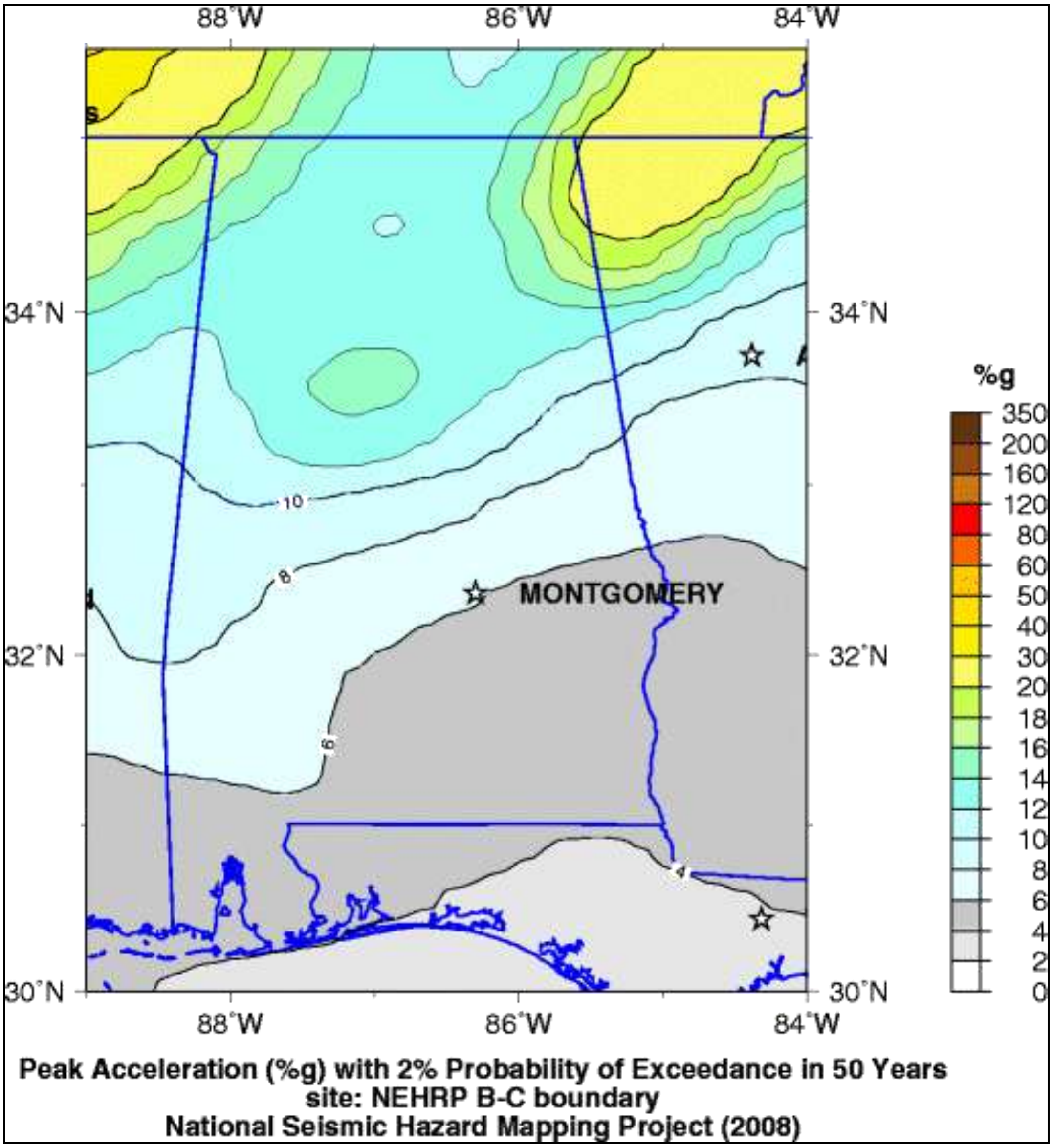
Figure 5-1. Modified Mercalli Intensity Scale

I.	**Not felt.**
II.	**Felt by persons at rest, on upper floors, or favorably placed.**
III.	**Felt indoors. Vibrations 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. Week 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. Pipelines severely damaged.**
XII.	**Damage nearly total.**

Source: Geological Survey of Alabama

The USGS publishes national seismic hazard maps which show likelihood of exceeding a level of earthquake shaking in a given time period. The shaking intensity is measured in peak ground acceleration (PGA) which is acceleration (shaking) of the ground expressed as a percentage of gravity (%g), or as a percentage of 9.8 meters per second squared. Map data from the 2008 national seismic hazard map (Map 5-14) shows Tuscaloosa County has only a 2% chance of exceeding shaking above 18%g in the next 50 years.

Map 5-14. State of Alabama Peak Ground Acceleration



Source: United States Geological Survey, Earthquakes Hazards Program

Previous Occurrences of Earthquakes

Map 5-15 "Alabama Earthquake Locations" shows the location and magnitude of recorded earthquakes since 1886. According to the Geological Survey of Alabama, twelve earthquakes were recorded in Tuscaloosa County from 1975 to 2012. Table 5-14 reports 12 earthquake events having occurred in Tuscaloosa County from 1975 to 2012 (by the Geological Survey of Alabama). The highest magnitude earthquake occurred in May 1986, registering 4.5 on the Richter scale.

Map 5-15. Alabama Earthquake Locations

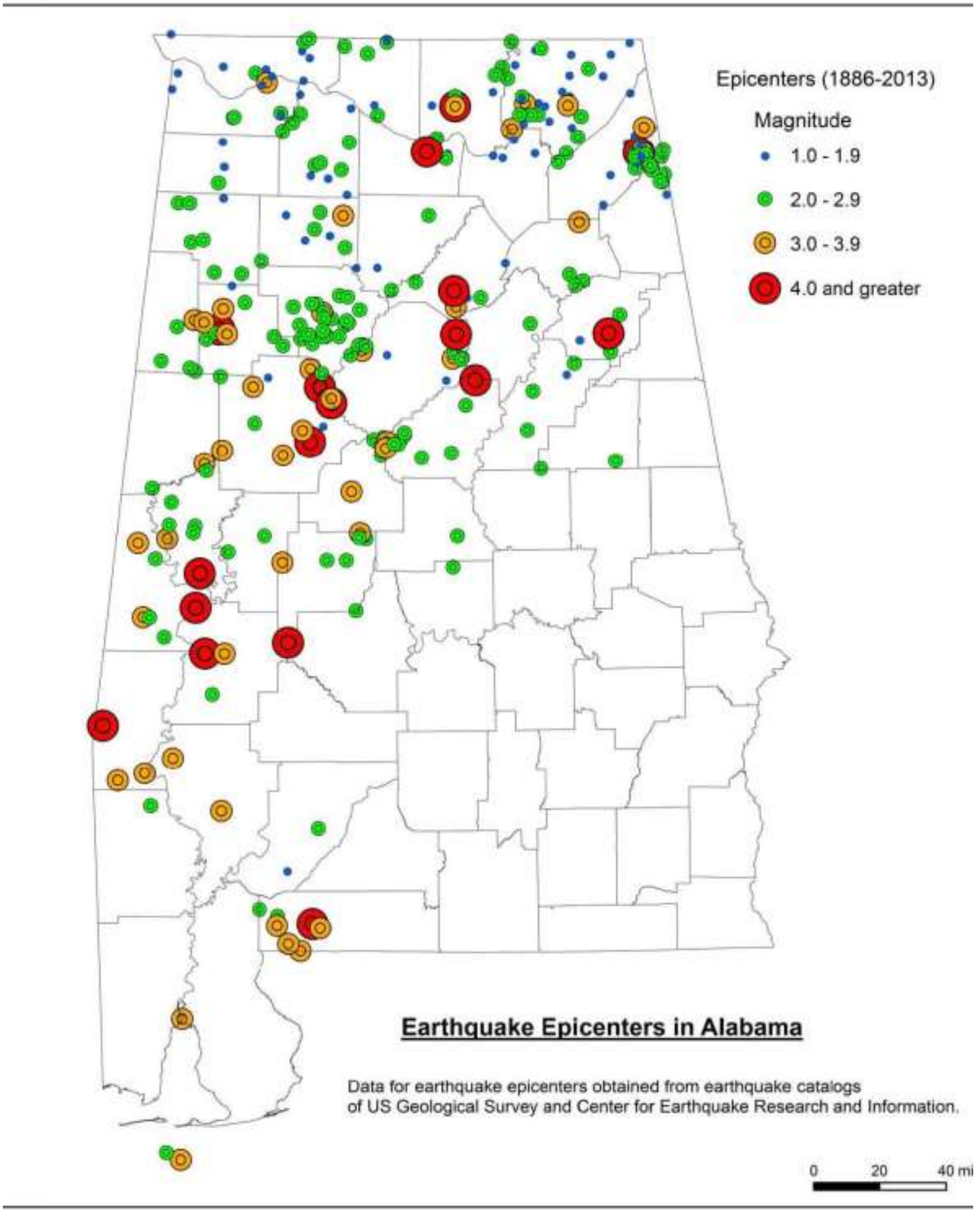


Table 5-14. Earthquake Events in Tuscaloosa County, 1975 - 2012

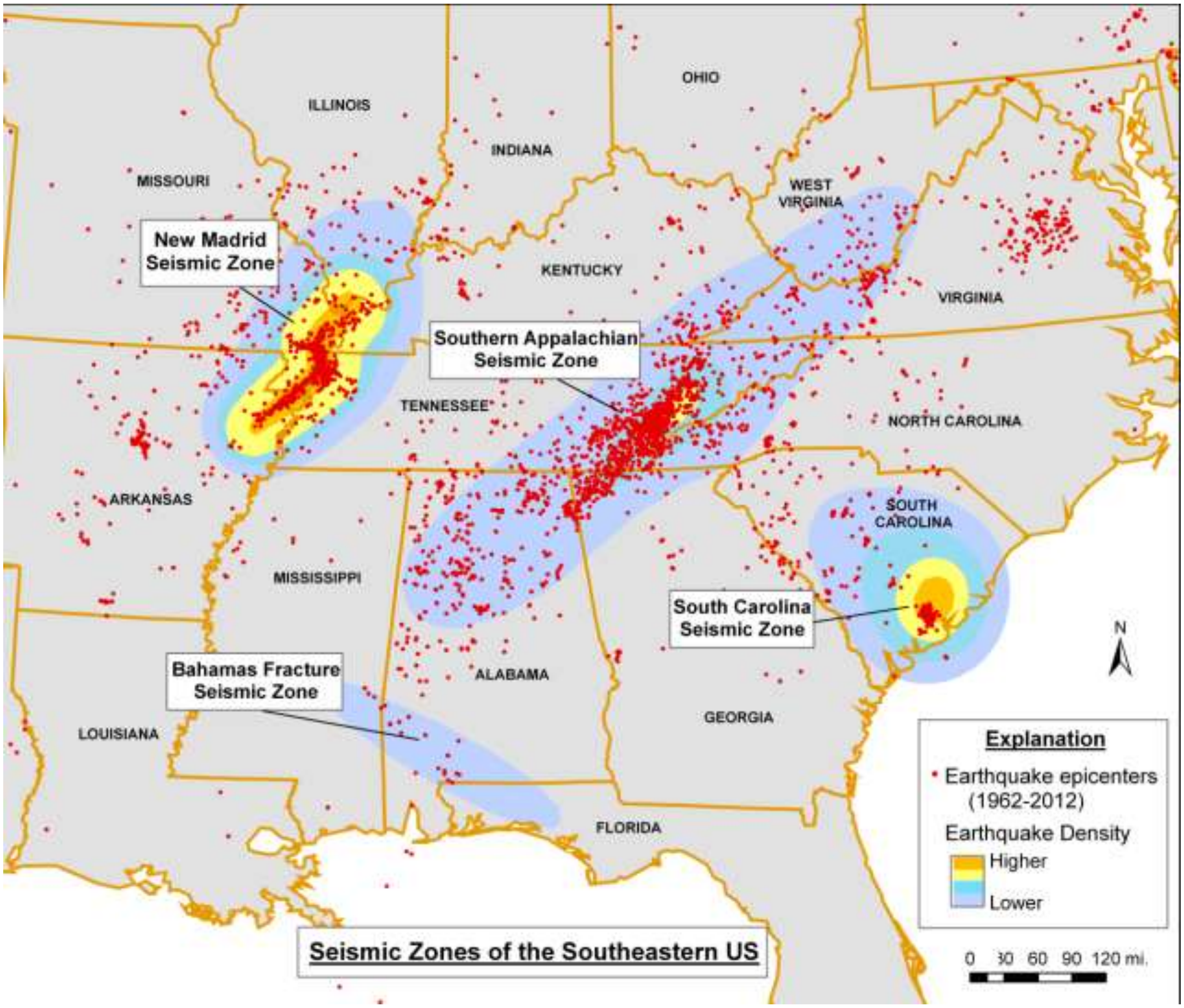
Name	Magnitude
Tuscaloosa Co Nov 7, 1975	3.4
Tannehill Dec 9, 1981	1.8
Tuscaloosa Co May 7, 1986	4.5
Samantha Apr 3, 1988	1.5
Tuscaloosa Sep 11, 1992	3.0
Romulus May 28, 1995	3.4
Samantha Jul 15, 1995	3.3
Tuscaloosa Sep 13, 1998	2.9
Tuscaloosa Co Jan 18, 1999	4.0
Newtonville Oct 18, 2003	2.7
Tuscaloosa Co Jun 28, 2008	3.1
Brookwood Dec 13, 2012	1.7

Source: Geological Survey of Alabama, 2012

Probability of Future Earthquake Events

Because Tuscaloosa County is affected by the Southern Appalachian Seismic Zone and the New Madrid Seismic Zone (see Map 5-16), earthquake potential is likely, although potential for significant shaking is low. Damage could be catastrophic in Tuscaloosa County if a powerful earthquake were to occur, because buildings have not been constructed to withstand such a powerful force. The last significant earthquake that affected Alabama was the 1895 New Madrid earthquake. This quake is estimated to have been a 6.8 in magnitude on the Richter scale and was moderately felt throughout the southeastern United States. The New Madrid Seismic Zone runs along the Mississippi River. Geologists agree that another major earthquake along the New Madrid Fault line could cause chimneys to fall, glass to break, and walls to crack in Tuscaloosa County.

Map 5-16. Seismic Zones in Southeastern United States



Source: Geological Survey of Alabama, Mapping and Hazards Program

5.4.10 Wildfires Profile

Wildfires are responsible for burning thousands of acres of land across the United States each year. These fires are uncontrolled and in dry conditions can spread rapidly through the surrounding vegetation and in some cases structures. Wildfires are large, fast moving, disastrous fires that occur in the wilderness or rural areas. Tuscaloosa County is susceptible to wild/forest fires especially during times of drought. Tuscaloosa County has a total of 692,687 acres of forestland.

Primary effects from wildfires in Tuscaloosa County include:

- Loss of property;
- Loss of livestock;
- Destruction of wilderness; and
- Crop destruction.

Hazardous results from significant wildfire in Tuscaloosa County include:

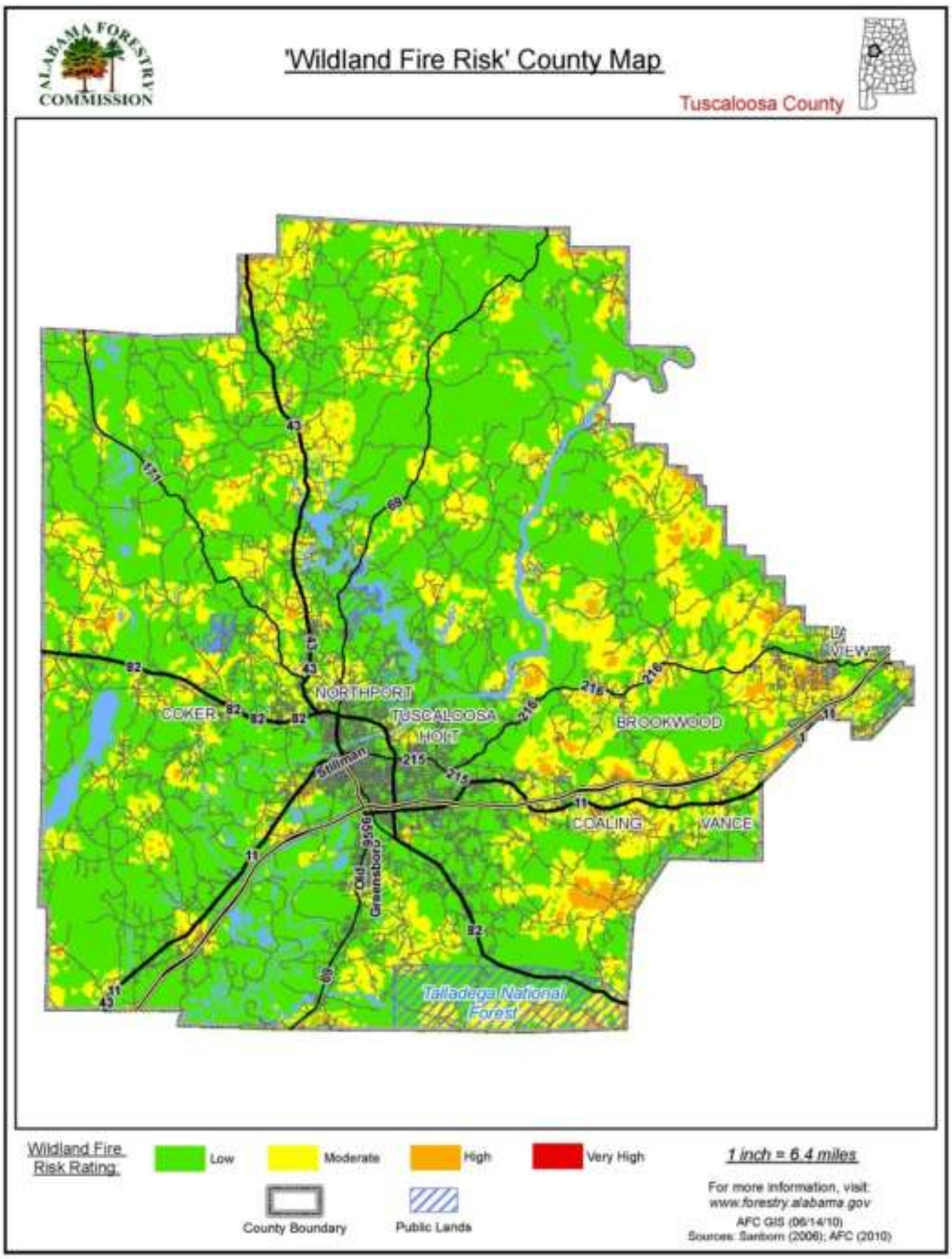
- Destruction of everything flammable, leaving people homeless and businesses destroyed.
- Inability for fenced-in livestock to escape the path of a wildfire, leaving them vulnerable to smoke inhalation.
- Potential destruction of entire forests, due to long-burning and exceptionally hot fires.
- Loss of crops through burning of all vegetation.

Non-permitted burns are a major issue in relation to wildfires. These burns tend to rage out of control, leading to damaging fires. Standard land management practices call for prescribed burns, thinning, mowing and the use of herbicides to reduce dangerous concentrations of underbrush vegetation, which in return, helps reduce the fuels available for wildfires and aids in the development of healthy habitats and regeneration of species.

Location of Potential Wildfires

The U.S. Forest Service (USFS) maintains data nationwide and produces various maps and forecasts daily under the Wildland Fire Assessment System (WFAS). A review of this data showed Tuscaloosa County has between a 5-10 percent probability of a fire occurring because of a lightning strike. The probability of ignition by lightning depends mainly on fuel moisture. Fuel Model Maps help to determine susceptibility of vegetative cover to wildfires. According to the USFS, Tuscaloosa County is covered by Fuel Models P and R. Areas covered by these models consist of southern pine and hardwood litter, summer. Similarly, the Alabama Forestry Commission collects data and produces wildfire risk maps, by county. Map 5-17 “Tuscaloosa County Wildfire Risk,” denotes risk levels for wildfires by area. According to this map, Tuscaloosa County has a low to moderate wildfire risk rating.

Map 5-17. Tuscaloosa County Wildfire Risk



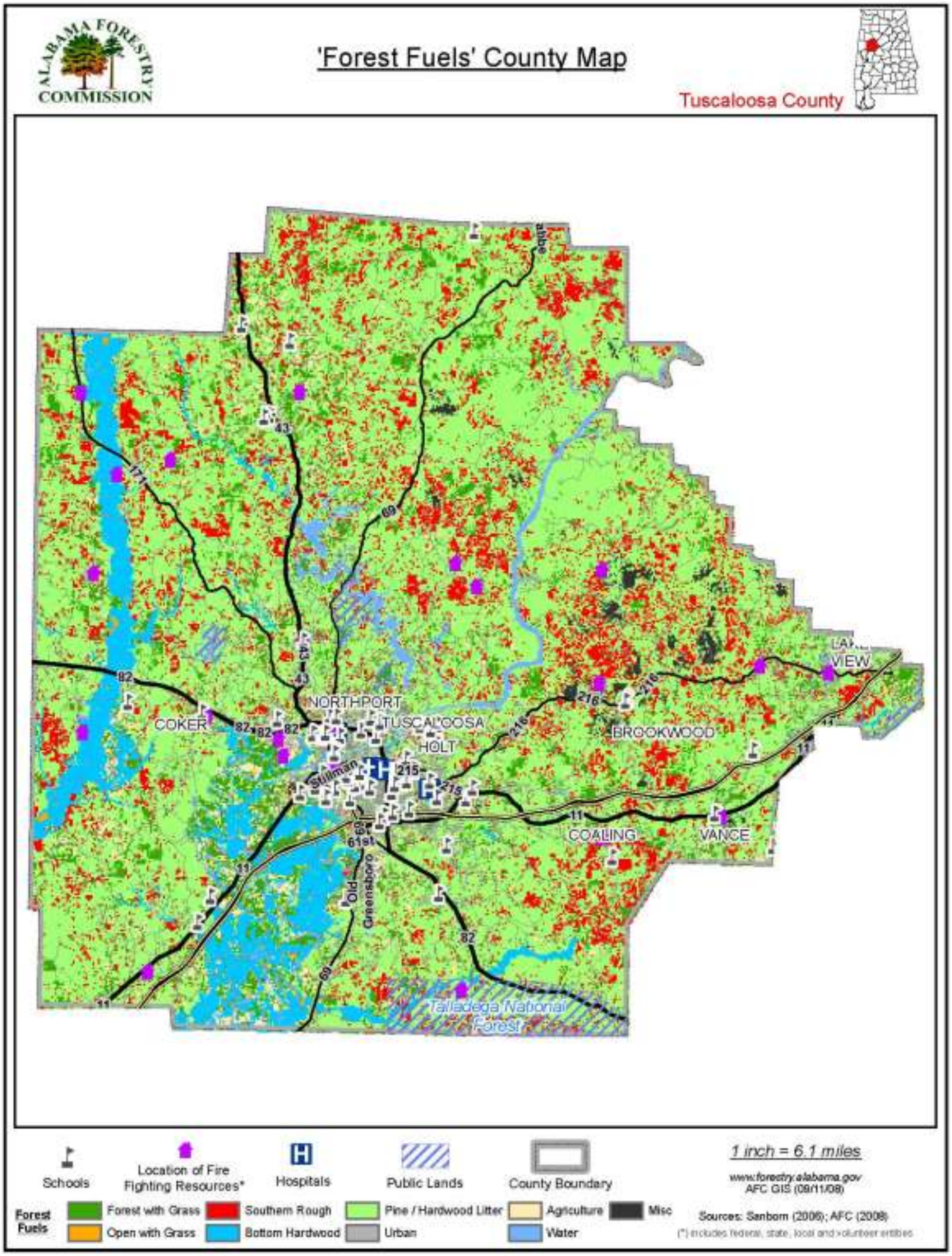
Extent and Intensity of Potential Wildfires

Tuscaloosa County has multiple fuel sources, as shown on Map 5-18 "Tuscaloosa County Forest Fuels", but is mostly characterized by Pine/Hardwood litter and Southern Rough. Tuscaloosa County is prone to drought and thunderstorms which increase the potential severity of wildfires significantly. Weather conditions, given the high frequency of severe storms with lightning and periodic severe drought conditions, can exacerbate wildfires.

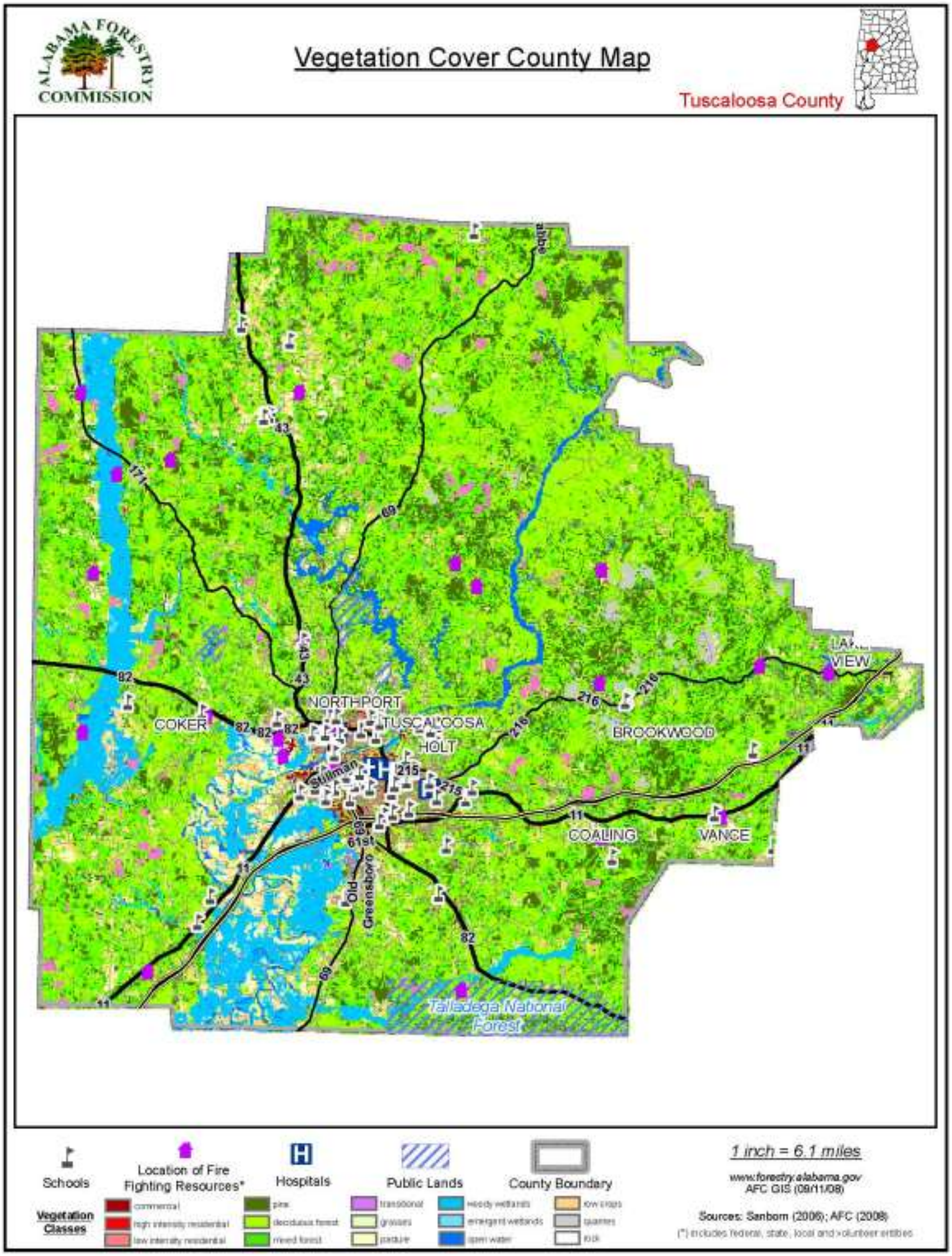
The weather is a natural contributor to wildfire occurrences. Extreme dry weather creates the perfect conditions for woodlands ready to spread fire rapidly. Droughts increase the inflammability of vegetation and pose greater difficulty in suppressing fires. Map 5-19 shows the vegetation cover in Tuscaloosa County, mostly deciduous forest and pine. In the midst of the 2006-2008 drought, in March 2007, a very dry month, there were approximately 1,000 acres a day burned in the State of Alabama. 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.

Firefighting resources can affect the severity of wildfires. Tuscaloosa County has a significant number of firefighting resources. The City of Tuscaloosa Fire & Rescue Service has 11 stations and more than 250 firefighters; the City of Northport has 4 stations and 70 personnel; the Town of Brookwood, Coaling, Coker, Moundville, Vance and Woodstock have volunteer fire departments; and the Town of Lake View has a partly staffed/volunteer fire department, with 2 stations. Additionally, Tuscaloosa County has a Forestry Commission office in Northport.

Map 5-18. Tuscaloosa County Forest Fuels



Map 5-19. Tuscaloosa County Vegetation Cover



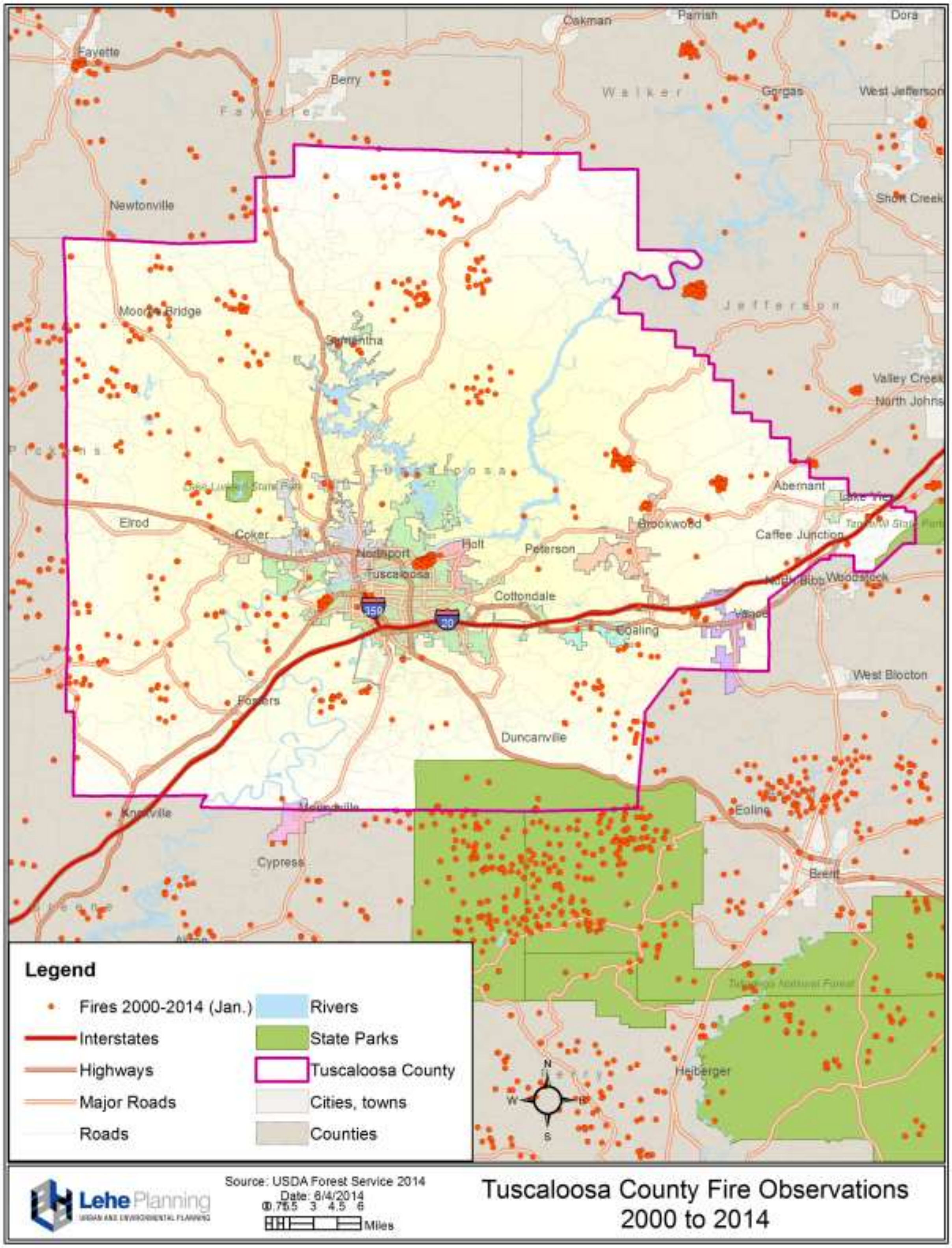
Previous Occurrences of Wildfires

According to the Alabama Forestry Commission, between January 1, 2009 and December 31, 2013, Tuscaloosa County had an average of 30.4 fires per year, with an average of 325 acres burned per year. Additionally, Tuscaloosa County has experienced 23 wildfires from January 1, 2014 to date.

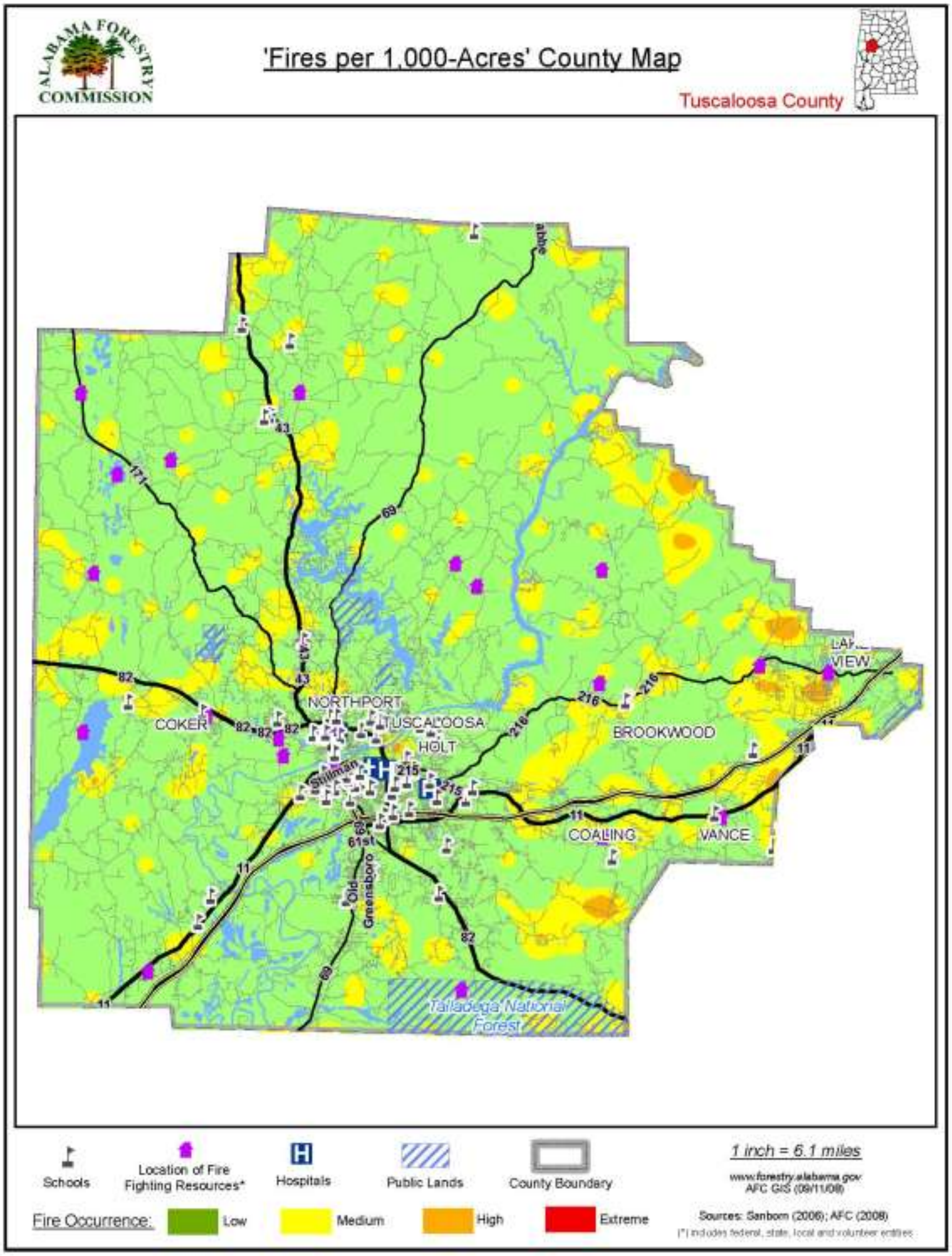
A wildfire, occurring on March 19, 2012, burned 70 to 100 acres of land in Brookwood, as a result of a debris fire that got out of control. The fire was completely contained and no injuries were reported.

Map 5-20 “Tuscaloosa County Fire Observations” shows the location of wildfires between 2000 and January 2014. Map 5-20 “Tuscaloosa County Fires Occurrences” shows areas at various levels of wildfire occurrences from low to high. These wildfire occurrence areas generally coincide with areas denoted as low to high risk areas on Map 5-17 “Tuscaloosa County Wildfire Risk.” The areas at highest risk in Tuscaloosa County are scattered throughout the county, somewhat more concentrated in the eastern portion. These areas are ranked as “High” or “Medium” on both the fire susceptibility and fire occurrence indexes.

Map 5-20. Tuscaloosa County Fire Observations



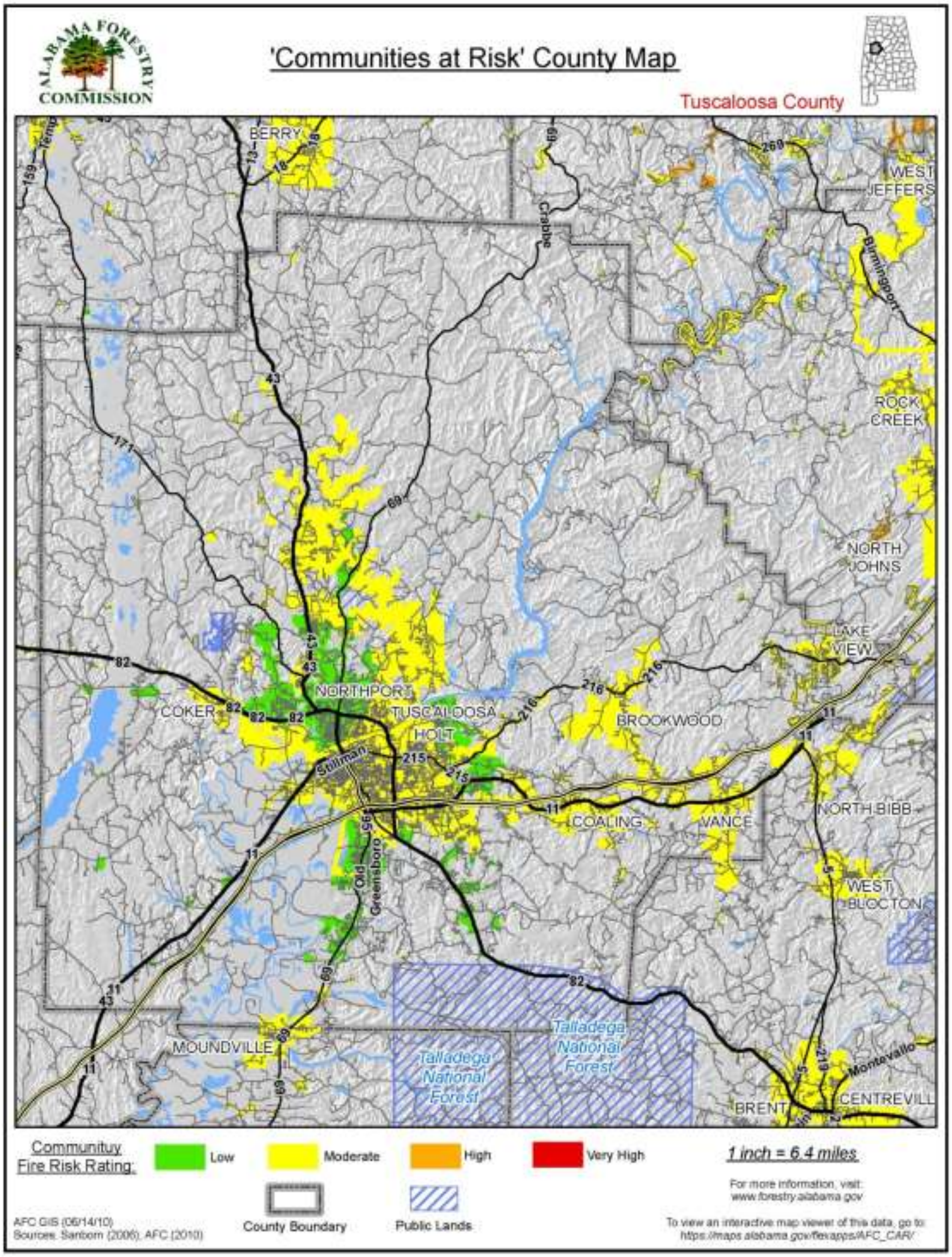
Map 5-21. Tuscaloosa County Fires Occurrences



Probability of Future Wildfire Events

Tuscaloosa County, on average, is the site of 30.4 wildfires per year, which cause damage to an average of 325 acres per year. The average size of each wildfire is 10.7 acres. Unless there are major changes in the weather, the probability of future events — based on recent trends and historical information — should remain approximately 30 wildfires per year, based on events between 2009 and 2013. Although one can extract data and estimates of future frequency from historical information, the risk of a specific wildfire occurring and the location of damage are largely random. Map 5-22 “Tuscaloosa County Communities at Wildfire Risk” rates the risk level of all Tuscaloosa communities. This is a new map developed by the Alabama Forestry Commission since the 2009 plan. All identified jurisdictions in the plan are characterized as a low to moderate risk for wildfire.

Map 5-22. Tuscaloosa County Communities at Wildfire Risk



5.4.11 Dam/Levee Failures Profile

The National Inventory of Dams lists 77 dams in Tuscaloosa County. Table 5-15 lists the number of dams classified in each potential downstream hazard category. Twenty-three (23) dams are classified as having high hazard potential, meaning failure or faulty operation would probably result in the loss of human life. Sixteen (16) dams are listed in the significant risk category meaning their failure or faulty operation would probably not result in the loss of life, but would result in economic loss, environmental damage, and disruption of lifeline facilities. The remaining thirty-eight (38) dams in the county are listed as at low risk meaning that their failure or faulty would not result in the loss of life and only low economic or environmental damage. None of the dams are located in a municipality.

Alabama is the only state in the country without a dam safety program, which means the state cannot track existing dams, inspections are not performed, and there is no database of breaches. In 2014, the State Legislature opted not to take action on House Bill 610, which would have implemented a dam safety program.

Table 5-15. Tuscaloosa County Dams Risk

Hazard Categories	Number of Dams
High	23
Significant	16
Low	38
Undetermined	0
Total	**77**

Source: Army Corps of Engineers

Dam and levee failures are potentially catastrophic flood events and can occur with little warning. A failure is usually the result of neglect, unsound construction, or structural damage attributable to an earthquake or other natural hazard. Severe dam and levee failures are very rare in the United States, but, when they do occur, downstream damages can include devastating human casualties, property damages, and altered natural landscapes.

Location of Potential Dam Failures

As a part of the National Dam Safety Program, the Corps included 67 private dams in Tuscaloosa County on the Dam Inventory list. An undetermined number of these private dams were listed as potentially unsafe, meaning that dam failure could result in loss of life and substantial property damage, or had major deficiencies, or needed remedial repairs. Most of the problems with these earthen dams involved inadequate spillways, non-working drawn down valves, erosion, and trees growing on the slopes. The US Army Corps of Engineers maintains and inspects the three federal dams along the Black Warrior River – Holt, Bankhead, and Oliver. The remaining dams are owned by the state or local government agency. Table 5-16 lists all of the dams in Tuscaloosa County and Map 5-23 shows the location of the major dams in the county.

Table 5-16. Tuscaloosa County Dams

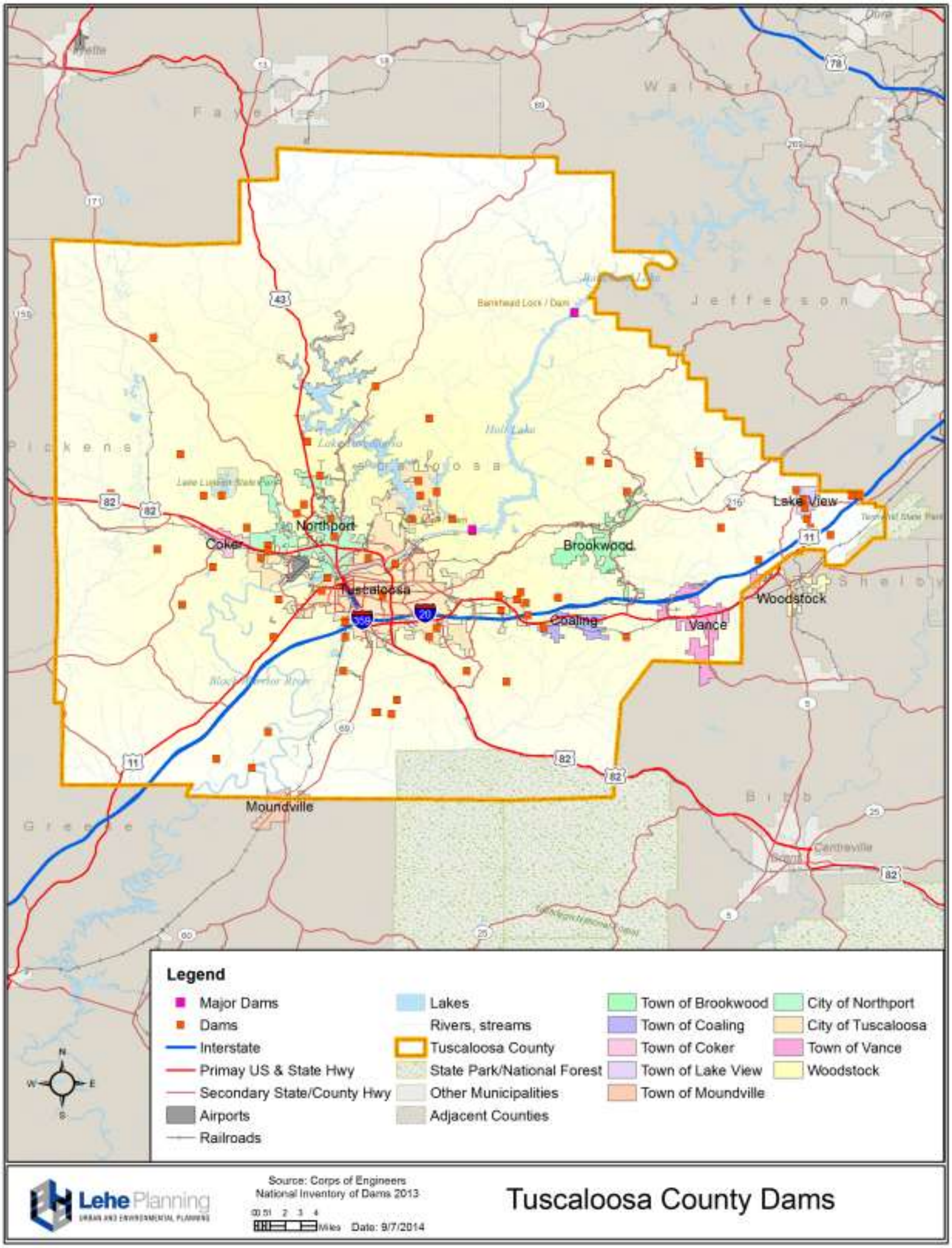
Dam Name	NID ID	Height (Ft.)	River	Max Discharge	Max Storage
AL No Name No. 1	AL01116	36	TR-Rockcastle Creek	203	209
Big Cypress Lake Dam	AL01136	11	TR-Black Warrior River	258	280
Bob Spiller	AL02267	23	Cypress Creek	100	80
Bryce Hospital Dam	AL01109	16	TR-Tater Hill Creek	2,276	91
Butch Wilson	AL02317	26	-	200	38
Cain Lake Dam Number 3	AL01437	29	TR-Wright Branch	513	62
Camp Horne Lake	AL01153	22	TR- Bee Branch	246	64
Camp Horne Lake Dam No. 1	AL01724	25	TR- Bee Branch	649	21
Canyon Lake Dam	AL01133	30	Bee Branch	4,465	155
Canyon Lake Dam Upper 3	AL01438	28	Bee Branch	700	82
Canyon Lake No 2	AL01155	32	TR-Bee Branch	340	116
Carolwood Lake Dam	AL01457	20	TR-Carroll Creek	586	86
Cunningham No. 1	AL01456	26	TR-Little Yellow Creek	700	95
Dream Lake Dam Number One	AL01123	29	Rockcastle Creek	700	372
Dream Lake Dam Number Three	AL01122	26	Rockcastle Creek	4,300	1,400
East Lake Dam	AL01453	30	TR-Cypress Creek	385	61
Echo Lake Dam	AL01132	26	Hurricane Creek	1,533	116
Elledge Lake Dam	AL01146	20	TR-Big Creek	1,367	150
Forest Lake Dam	AL01142	17	TR-Cribbs Mill Creek	22	90
Fresh Water Impoundment No. 1	AL83464	40	-	1,000	360
Fresh Water Impoundment No. 1	AL83467	40	-	700	45
Fresh Water Impoundment No. 2	AL83468	50	-	3,500	200
Gilbert Tommie Lake Dam	AL01126	18	TR-Cooley Creek	751	83
Gilbert Tommie No. 2	AL01460	32	TR-Cooley Creek	489	158
Harless Lake Dam	AL01455	28	TR-Box Creek	268	78

Dam Name	NID ID	Height (Ft.)	River	Max Discharge	Max Storage
Herring Lake Dam	AL01121	17	Rockcastle Creek	550	50
Holt Lock Dam & Powerhouse	AL01426	120	Black Warrior River	639,500	117,990
Indian Hills Lake	AL01154	26	TR-Black Warrior River	540	62
Jack Duke Lake Dam	AL01113	17	TR-Wright Branch	758	153
Jaycee Partlow Dam Number One	AL01147	12	TR-Tater Hill Creek	887	94
Jaycee Partlow Dam Number Two	AL01148	11	TR-Tater Hill Creek	481	79
JB Acker	AL02268	24	Sipsey River	170	95
John Hollis Bankhead Lock Dam & PH	AL01427	111	Black Warrior River	666,000	296,000
Lake Anedna	AL01140	15	TR-Big Creek	486	126
Lake Duke Dam Lower	AL01446	26	Wright Branch	50	141
Lake Gloria Dam	AL01143	12	Grant Creek	535	84
Lake Grace Dam	AL01130	25	TR -Bee Branch	422	99
Lake Harris Dam	AL01150	58	Yellow Creek	3,511	3,526
Lake Judson Dam	AL01128	21	Bunch Creek	1,950	108
Lake Lurleen Dam	AL01108	41	TR-Big Creek	3,730	3,164
Lake Nicol Dam	AL01111	82	Yellow Creek	1,924	10,349
Lake No. 7 Dam	AL01445	29	TR-Rockcastle Creek	300	83
Lake Retreat Dam	AL01444	28	TR-Davis Creek	305	120
Lake Sherwood Dam	AL01145	20	TR-Mill Creek	1,800	78
Lake Tina Dam	AL01452	19	TR-Black Warrior River	203	92
Lake Tuscaloosa Dam	AL01137	125	North River	50,000	180,000
Lake Tuscoba Dam	AL01442	20	TR-Twomile Creek	6,125	256
Lake Wildwood Dam	AL01135	32	TR-Kepple Creek	2,118	295
Lary Lake Dam	AL01124	34	TR-Lary Creek	1,030	357
Little Reservoir Dam	AL01441	40	TR-Black Warrior River	95	106
Mallard Lake Dam	AL01131	26	Bee Branch	641	159
McPherson Dam	AL01443	30	TR-Black Warrior River	403	73

Dam Name	NID ID	Height (Ft.)	River	Max Discharge	Max Storage
Mildred Warner Dam	AL01110	30	TR-Jay Creek	550	543
Mills Lake Dam Lower	AL01447	16	TR-Mill Creek	330	86
Mimosa Park Dam	AL01134	17	TR- Cypress Creek	27	568
Mud Lake Dam	AL01118	24	Gallant Branch	960	103
Northwood Lake Dam	AL01138	21	TR-Twomile Creek	231	560
Old Railroad Grade Pond	AL01157	26	TR-Little Sandy Creek	3	83
Paradise Lake Dam	AL01112	16	TR-Gallant Branch	1,860	153
Patton Lake	AL01152	19	TR-Cribbs Mill Creek	580	60
Pine Lake Dam	AL01149	25	TR-Thornton Creek	207	273
Russell Lee Lake Dam	AL01451	11	TR-Black Warrior River	292	78
Sewage Lagoon Dam North	AL01439	16	TR-Cribbs Mill Creek	122	76
Sewage Lagoon Dam South	AL01440	16	TR-Cribbs Mill Creek	122	104
Skelton No. 1	AL01450	20	TR-Black Warrior River	250	106
Slurry Impoundment No. 1	AL83465	40	-	200	500
Slurry Impoundment No. 1	AL83466	80	-	2,000	960
Snag Lake Dam	AL01139	12	TR- Black Warrior River	132	234
Springhill Lake Dam	AL01151	27	Cypress Creek	2,778	153
Steiner Lake Dam	AL01127	23	TR-Horse Creek	2,462	112
Swanson Lake Dam	AL01144	13	TR-Mill Creek	298	99
Vining Pond Dam	AL01448	31	TR-Hurricane Creek	64	146
Wagon Wheel Lake Dam	AL01454	26	TR-Tierce Creek	1,182	80
William Bacon Oliver Replacement	AL01981	67	Black Warrior River	52,000	13,800
Williams Lake	AL02450	33	Black Warrior River	80	77
Yacht Club Bay Dam No. 15	AL01458	45	TR-North River	120	72
Yacht Club Bay Dam No. 8	AL01459	41	TR-North River	485	28

Source: USACE National Inventory of Dams, 2014

Map 5-23. Tuscaloosa County Dams



Extent of Potential Dam/Levee Failures

Dams and levees do not pose a significant risk to developed areas of Tuscaloosa County. The dams are located in remote areas of unincorporated Tuscaloosa County.

Previous Occurrences of Dam/Levee Failures

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

Primary effects from dam/levee failures in Tuscaloosa County include:

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

Hazardous results from dam/levee failures in Tuscaloosa County include:

1. Heavy flooding leading in many deaths by injuring and trapping people in structures.
2. Large amounts of water wiping out and/or severely damaging property.
3. Chemical spills from local factories caused by rushing water, polluting the area and destroying crops.
4. Breach of dam, causing the river to flow naturally and interrupt wildlife cycles and hydrologic power supply.
5. Increased disease such as West Nile and Malaria, as a result of unsanitary conditions.

Probability of Future Dam/Levee Failure Events

Considering the number of dams in Tuscaloosa County, especially those privately owned (and not maintained by the Army Corps of Engineers), the risk to Tuscaloosa County associated with dam failure are moderate. The U.S. Corps of Engineers monitors and inspects three dams along the Black Warrior River – Bankhead, Holt and Oliver. Therefore, these dams pose little risk for failure.

5.4.12 Manmade and Technological Hazards Profile

Manmade and technological hazards are any threats that originate from or are induced by human activity, unlike the natural hazards previously profiled which have an origin in the natural environment. Technological disasters and acts of terrorism are the main categories of manmade hazards, according to FEMA, and have been subdivided into ten incident types in order to identify and prioritize these threats, as well as track specific occurrences for this plan. FEMA's term, "technological hazards," are those "incidents that can arise from human activities such as manufacture, transportation, storage, and use of hazardous materials." The term "terrorism" refers to "intentional, criminal, [or] malicious acts" (FEMA 387-7). This section is new since the last plan update

Location of Potential Manmade Hazards

All Tuscaloosa County jurisdictions are subject to manmade hazards and equally at risk. Map 5-24 shows the locations of hazardous materials storage, most of which are located in and around the City of Tuscaloosa, including Northport and Coker. In addition, there is one in Moundville, two in Vance, three outside of Brookwood, and one in the western rural portion of Tuscaloosa County. As described above, hazardous materials events can occur anywhere those materials are manufactured, stored, or transported. Also, depending on the type of material, the threat could be far reaching if it is able to be transported through the air or water.

Extent and Intensity of Potential Manmade Hazards

Tuscaloosa County has on average 2.3 hazardous materials events per year. The extent of hazardous materials spills can be minimal to severe, sometimes costing thousands of dollars for clean-up. The extent of technological hazards impacts and terrorist attacks can be quite severe, with potential for widespread damage to property and infrastructure and major loss of life and casualties, within any jurisdiction.

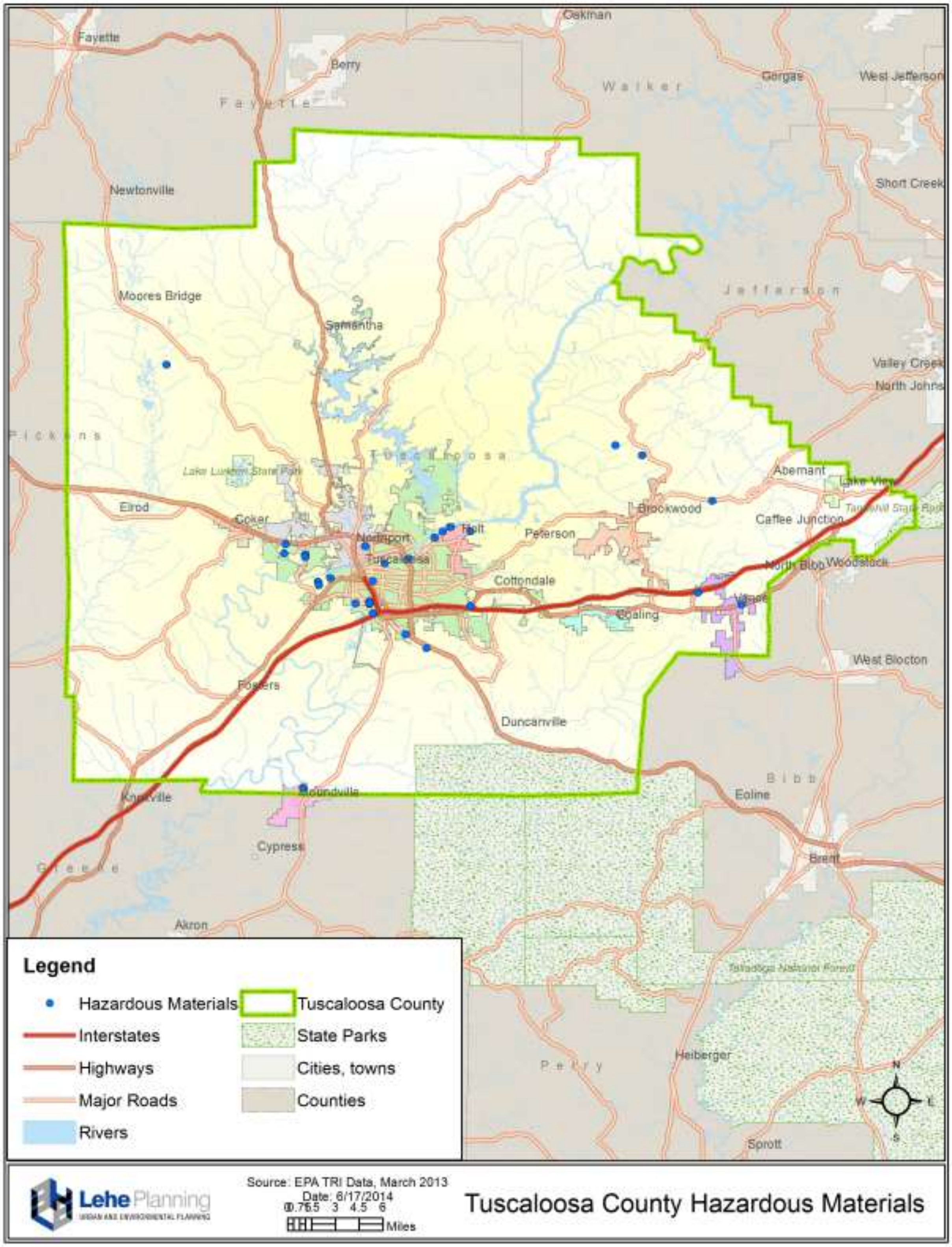
Previous Manmade and Technological Hazard Occurrences

There are 42 incidents on record for Tuscaloosa County during the time period between 1996 and 2013. The United States Department of Transportation's Hazardous Materials Information System was utilized along with local input to provide data for this section. Thirty-five of these incidents occurred in the City of Tuscaloosa, three occurred in Vance, two occurred in Northport, and one each occurred in Moundville and Lake View. Of these, 14 were considered serious incidents and two resulted in fatalities.

Probability of Future Manmade and Technological Hazard Events

One of the hardest features to grasp of a manmade and technological hazard is its unpredictability. There is no way to determine if there is going to be a manmade hazard at any certain time. For many natural hazards there is a season (e.g., hurricanes and tornadoes), a map of probable locations (e.g., floods and earthquakes) or forecasts (e.g., severe storms). For manmade hazards, events can happen anytime and virtually anywhere, and they do not need any specific circumstances in which to occur.

Map 5-24. Tuscaloosa County Hazardous Materials Storage



5.5 Vulnerability of Structures within Each Jurisdiction

5.5.1 Scope of Structure Inventory

Section 5.5 presents an inventory of existing and future buildings, critical facilities, and infrastructure. For the purposes of this risk assessment, *vulnerability* refers to the exposure of buildings, critical facilities, and infrastructure to a particular hazard and their susceptibility to damage from the hazard. The inventory in this section forms the loss estimates in Section 5.6 “Estimate of Dollar Losses to Vulnerable Structures.”

Many Tuscaloosa County hazards are county-wide, including severe storms, hurricanes, tornadoes, winter storms/freezes, droughts/heat waves, wildfires, and earthquakes. Floods, sinkholes, dam/levee failures, and landslides, on the other hand, are location-specific hazards.

5.5.2 Inventory Methodology

The planning team assembled structure inventories in three steps.

First, a countywide inventory of the number and property values of structures was created using FEMA’s HAZUS-MH, which is a risk assessment software tool for projecting losses from floods, hurricane winds, and earthquakes. The planning team used the latest edition of HAZUS-MH software (version 2.1). HAZUS-MH modeled scenarios for Tuscaloosa County using a Level 1 analysis, which utilizes data provided with the software and calculates damages at the county level. Calculations below the county level are not recommended, because accuracy tends to diminish.

Second, the planning team used local GIS data to create maps and lists of critical facilities located in vulnerable areas. The GIS data came from Tuscaloosa County, Geological Survey of Alabama, U.S.G.S., National Weather Service, NFIP, U.S. Census Bureau, Alabama State Data Center, and the Alabama Forestry Commission.

Third, to estimate future building values and exposures, the planning team applied population projections from the Alabama State Data Center to the HAZUS-MH tables of existing building values. It is important to note that both population projections and HAZUS-generated structure counts and values are approximate; however, the planning team’s estimates are useful for prioritizing mitigation measures by place and hazard, since the *relative* values of existing and future populations, values, and rates of exposure are probably accurate.

The designation *building,* as used in this risk assessment, includes all walled and roofed structures. The designations *critical facilities* and *infrastructure* include the following structures, as classified by HAZUS-MH:

Critical Facilities

- Essential Facilities. These critical facilities are essential to the health and welfare of the entire Tuscaloosa 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 critical facilities include military installations, nuclear power plants and dams.

Infrastructure

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

Critical facilities and infrastructure have been apportioned to each jurisdiction on the basis of 2012 population distribution, as shown in Table 5-17. The total percentage does not equal 100%, due to rounding.

Table 5-17. 2012 Population Distribution by Jurisdiction

Jurisdiction	2012 Estimate	% of Total
Brookwood	1,834	0.9%
Coaling	1,665	0.8%
Coker	982	0.5%
Lake View	2,041	1.0%
Moundville	2,439	1.2%
Northport	24,120	12.1%
Tuscaloosa	93,683	47.1%
Vance	1,535	0.8%
Woodstock	1,443	0.7%
Unincorporated	68,952	34.7%
Tuscaloosa County	198,694	99.8%

Source: U.S. Census, American Fact Finder

The plan projects future numbers of buildings, critical facilities, and infrastructure to the year 2030 using the Alabama State Data Center's projection of Tuscaloosa

County population growth. Since no projections existed for individual jurisdictions, the method described here was developed to provide a 2030 projected population for each jurisdiction. To project populations for each jurisdiction, the annual growth rate for each jurisdiction has been calculated based upon population growth between 1990 and 2012. In the case of the overall population of Tuscaloosa County, the Alabama State Data Center 2030 county estimate has been used, and the unincorporated area projection is that countywide population less the total of all municipal populations.

The 2030 populations of Tuscaloosa County and its jurisdictions are used to compute *growth multipliers.* The growth multiplier is equal to 1 + the 2012-2030 percentage increases for each jurisdiction. For example, if 1,000 residential buildings are presently exposed, then a 2030 Growth Multiplier of 1.24 (where a jurisdiction's population is projected to increase 24 percent) would project 1,240 residential buildings will be exposed in 2030. The Growth Multiplier is applied to all present day estimates to project future conditions. This growth projection method is not precise, but it does provide a good indication of how growth might affect future exposure of structures to hazards.

Table 5-18. 2030 County Growth Projection

	2012	2030	Number	Percent
Tuscaloosa County	198,694	231,846	33,152	16.7%

Source: Alabama State Data Center, 2014

Table 5-19. Annual Growth Rates by Jurisdiction

Jurisdiction	1990	2010	Est. 2012	1990-2012 Growth*	% Change 1990-2012	Annual Growth Rate
Brookwood	658	1,828	1,834	1,176	178.7%	4.77%
Coaling	1,181	1,657	1,665	484	41.0%	1.57%
Coker	956	979	982	26	2.7%	0.12%
Lake View	1,012	1,943	2,041	1,029	101.7%	3.24%
Moundville	--	2,427	2,439	12	0.5%	0.02%
Northport	17,297	23,330	24,120	6,823	39.4%	1.52%
Tuscaloosa	77,759	90,468	93,683	15,924	20.5%	0.85%
Vance	248	1,529	1,535	1,287	519.0%	8.64%
Woodstock	--	1,428	1,443	15	1.1%	0.05%
Unincorporated	--	69,067	68,952	-115	-0.2%	-0.01%
Tuscaloosa Co.	150,522	194,656	198,694	48,172	32.0%	1.27%

Source: Derived from the US Census

*Moundville, Woodstock & Unincorporated growth rates are based on 2010-2012 changes, due to the absence of 1990 Census data for these jurisdictions.

Table 5-20. 2030 Growth Projections and Multipliers

Jurisdiction	Estimated 2012	Annual Growth Rate	Projected 2030	Projected Change 2012-2030	Percent Change 2012-2030	2030 Growth Multiplier
Brookwood	1,834	4.77%	4,243	2,409	131.35%	2.31
Coaling	1,665	1.57%	2,204	539	32.37%	1.32
Coker	982	0.12%	1,003	21	2.18%	1.02
Lake View	2,041	3.24%	3,623	1,582	77.53%	1.78
Moundville	2,439	0.25%	2,551	112	4.60%	1.05
Northport	24,120	1.52%	31,645	7,525	31.20%	1.31
Tuscaloosa	93,683	0.85%	109,101	15,418	16.46%	1.16
Vance	1,535	8.64%	6,822	5,287	344.44%	4.44
Woodstock	1,443	0.52%	1,584	141	9.79%	1.10
Unincorporated	68,952	-0.08%	69,069	117	0.17%	1.00
Tuscaloosa Co.	198,694	1.27%	231,846	33,152	16.68%	1.17
*Countywide population is provided by the Alabama State Data Center; unincorporated is the remaining County population						

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

Table 5-21. 2030 Population Distribution by Jurisdiction

Jurisdiction	2030 Population*	% of Total
Brookwood	4,243	1.83%
Coaling	2,204	0.95%
Coker	1,003	0.43%
Lake View	3,623	1.56%
Moundville	2,551	1.10%
Northport	31,645	13.65%
Tuscaloosa	109,101	47.06%
Vance	6,822	2.94%
Woodstock	1,584	0.68%
Unincorporated	69,069	29.79%
Tuscaloosa Co.	231,846	100.00%

Source: Derived from Alabama State Data Center

*Sum of all jurisdiction 2030 population totals equals 231,845, due to rounding

5.5.3 HAZUS-MH Structure Inventory

The percent exposure can be applied to the structure inventories to derive a general estimate of vulnerable structures by hazard. Most hazards are county-wide, but location-specific hazards – flooding, dam/levee failures, sinkholes and landslides – can vary from minimal vulnerability to as much as 100% of a community's total geographic area. In cases where exposure is 1% or less, a 1% exposure rate has been applied. 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. This data is shown in Table 5-22 below.

Table 5-22. Hazard Exposure Rates by Jurisdiction

Identified Hazard	Brookwood	Coaling	Coker	Lake View	Moundville	Northport	Tuscaloosa	Vance	Woodstock	Unincorporated	Tuscaloosa Co.
Tornadoes	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Severe Storms	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Floods	1%	1%	5%	1%	5%	5%	5%	1%	1%	5%	5%
Winter Storms/Freezes	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Hurricanes	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Droughts/Heat Waves	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Wildfires	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Dam/Levee Failures	1%	0%	0%	0%	0%	1%	1%	0%	0%	1%	1%
Landslides	<1%	<1%	1%	<1%	<1%	<1%	<1%	<1%	<1%	5%	5%
Earthquakes	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Sinkholes	0%	<1%	0%	1%	0%	0%	0%	1%	1%	<1%	<1%
Man-Made Hazards	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

General Description of the Planning Region

HAZUS-MH refers to the geographic study area as the *region*, which is all of Tuscaloosa County, including all unincorporated areas and 9 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 hurricanes. The Tuscaloosa County region is generally described by HAZUS-MH, as follows:

- The geographical size of the region is 1,351.5 square miles.
- The region contains 45 census tracts.

- There were over 62,000 households in the region, with a total population of 164,875 persons (Census 2002 data).

Table 5-23. HAZUS-MH Population and Building Value Data

State	County Name	2010 Population	Building Value (thousands of dollars)		
			Residential	Non-Residential	Total
Alabama	Tuscaloosa	194,656	$8,197,553	$3,157,350	$11,354,903

Table 5-24. HAZUS-MH Building Inventory by Occupancy

Occupancy	Count	Share
Agriculture	246	0.4%
Commercial	3,716	5.5%
Education	111	0.2%
Government	100	0.1%
Industrial	1,186	1.7%
Religion	418	0.6%
Residential	62,386	91.5%
Total	**68,163**	**100%**

Building Inventory

- HAZUS-MH estimates that there are 68,163 buildings in the region, which have an aggregate replacement value of $11,355,000 (2006 dollars).
- In terms of building construction types found in the region, wood frame construction makes up approximately 67% percent of the building inventory. Manufactured housing accounts for approximately 18% of buildings, a considerable amount.

Table 5-25. HAZUS-MH Building Inventory by Construction Type

Construction Type	Count	Share
Wood	47,816	70.2%
Steel	2,838	4.2%
Concrete	893	1.3%
Masonry	6,443	9.5%
Manufactured Housing	10,161	14.8%
Total	**68,151**	**100%**

Critical Facilities Inventory

HAZUS-MH breaks critical facilities into the two groups described below and estimates the number of each type of facility.

(1) **Essential facilities,** which include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. HAZUS-MH estimates the numbers and types of essential facilities within the region, as follows:

- ✓ 4 hospitals with a total bed capacity of 1,735 beds;
- ✓ 61 schools;
- ✓ 15 fire stations;
- ✓ 1 emergency operations center; and
- ✓ 11 police stations.

(2) **High potential loss facilities,** which include dams, levees, military installations, and nuclear power plants. HAZUS-MH estimates the numbers and types of high potential loss facilities, as follows:

- ✓ 79 dams, with 23 classified as "high hazard;"
- ✓ 107 hazardous materials sites;
- ✓ 0 military installations; and
- ✓ 0 nuclear power plants.

Transportation and Utility Lifeline Inventories

HAZUS-MH breaks lifeline inventories into the two groups described below and estimates the number of each type of facility. HAZUS-MH estimates the total value of the lifeline inventory at $1.2 billion. A more detailed breakdown is provided in Table 5-32 "HAZUS-MH Transportation System Lifeline Inventory."

(1) **Transportation systems,** which include highways, railways, light rail, bus, ports, ferry and airports. HAZUS-MH estimates the length of highways and the number of bridges, as follows:

- ✓ 273 miles (439 kilometers) of highways;
- ✓ 364 highway bridges;
- ✓ 22 miles of railway; and
- ✓ 1 airport with 2 runways.

(2) **Utility systems,** which include potable water, wastewater, natural gas, crude & refined oil, electric power, and communications. HAZUS-MH estimates the length of pipes, as follows:

- ✓ 6,560 miles (10,557 kilometers) of potable water, waste water, and natural gas pipes.

5.5.4 Existing and Future Structure Vulnerabilities by Hazard and Jurisdiction

Buildings

The building exposure totals generated by HAZUS-MH are gross estimates that show relative vulnerability of buildings to earthquakes, hurricane winds, and flooding. The numbers provided in the HAZUS-MH reports are not based on actual field inventories, which is beyond the scope of this planning process. Many of the numbers provided by HAZUS-MH are generated from formulas based on national standards. Where values are given for future conditions, the values are in 2006 dollars.

Building exposure in Tuscaloosa County is mostly residential at about 72%. Commercial building exposure comprises approximately 18%. This ratio should remain constant through the 2030 plan horizon, and occupancy ratios are assumed constant for the purposes of this analysis.

Table 5-26. Building Exposure by Occupancy

Occupancy	Existing Exposure ($1,000)	Future Exposure ($1,000)	% of Total (Future)
Agriculture	$40,656	$47,568	0.36%
Commercial	$2,013,633	$2,355,951	17.73%
Education	$160,076	$187,289	1.41%
Government	$54,722	$64,025	0.48%
Industrial	$577,682	$675,888	5.09%
Religious	$310,581	$363,380	2.74%
Residential	$8,197,553	$9,591,137	72.19%
Total	**$11,354,903**	$13,285,237	**100%**

Building values within each jurisdiction are expected to increase according to (a) growth in Tuscaloosa County's population; and (b) the growth in each jurisdiction's share of the county population. Communities need to be cognizant of the increasing risks and exposure resulting from growth.

Tuscaloosa County is projected to increase in growth approximately 16.7% from 2012 to 2030, with the highest growth rates in Vance and Brookwood. The areas with the least projected amount of growth are Coker and Moundville. Occupancy of buildings by jurisdiction is assumed to generally follow the county-wide distribution, and is projected to change according to each jurisdiction's growth multiplier. See Tables 5-27 to 5-29 for estimated building values, building counts, and building exposure by jurisdiction.

Table 5-27. Building Values by Jurisdiction

Jurisdiction	Building Value					
	Existing Residential	Future Residential	Existing Non-Residential	Future Non-Residential	Existing Total	Future Total
Brookwood	$73,773	$175,056	$28,413	$67,421	$102,186	$242,477
Coaling	$65,576	$90,876	$25,256	$35,000	$90,832	$125,876
Coker	$40,985	$41,133	$15,785	$15,842	$56,770	$56,976
Lake View	$81,970	$149,228	$31,570	$57,474	$113,540	$206,702
Moundville	$98,364	$105,225	$37,884	$40,526	$136,248	$145,751
Northport	$991,837	$1,305,745	$381,997	$502,896	$1,373,834	$1,808,641
Tuscaloosa	$3,860,787	$4,501,712	$1,486,947	$1,733,793	$5,347,734	$6,235,506
Vance	$65,576	$281,237	$25,256	$108,316	$90,832	$389,553
Woodstock	$57,379	$65,048	$22,099	$25,053	$79,478	$90,101
Unincorporated	$2,844,359	$2,849,681	$1,095,479	$1,097,529	$3,939,838	$3,947,210
Tuscaloosa County	$8,197,000	$9,565,899	$3,157,000	$3,684,219	$11,354,000	$13,250,118

Note: Totals of all municipalities and unincorporated areas may not equal Tuscaloosa County totals due to rounding.

Table 5-28. Building Count by Occupancy and Jurisdiction

Jurisdiction	Building Count by Occupancy													
	Agric.		Commercial		Education		Govt.		Industrial		Religion		Residential	
	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future
Brookwood	2	5	33	79	1	2	1	2	11	58	4	9	561	1,332
Coaling	2	3	30	41	1	1	1	1	9	30	3	5	499	692
Coker	1	1	19	19	1	1	1	1	6	14	2	2	312	313
Lake View	2	4	37	68	1	2	1	2	12	49	4	8	624	1,136
Moundville	3	3	45	48	1	1	1	1	14	35	5	5	749	801
Northport	30	39	450	592	13	18	12	16	144	432	51	67	7,549	9,938
Tuscaloosa	116	135	1,750	2,041	52	61	47	55	559	1,490	197	230	29,384	34,262
Vance	2	8	30	127	1	4	1	3	9	93	3	14	499	2,140
Woodstock	2	2	26	29	1	1	1	1	8	22	3	3	437	4,951
Unincorporated	85	86	1,289	1,292	39	39	35	35	412	943	145	145	21,648	21,689
Tuscaloosa County	246	287	3,716	4,337	111	130	100	117	1,186	3,167	418	488	62,387	72,806

Note: Totals of all municipalities and unincorporated areas may not equal Tuscaloosa County totals due to rounding.

Table 5-29. Building Exposure by Jurisdiction and Hazard

Identified Hazard	Building Exposure ($1000s) by Jurisdiction																					
	Brookwood		Coaling		Coker		Lake View		Moundville		Northport		Tuscaloosa		Vance		Woodstock		Unincorporated		Tuscaloosa County	
	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future
Tornadoes	102	242	91	126	57	57	114	207	136	146	1,374	1,809	5,348	6,236	91	390	79	90	3,940	3,947	11,354	13,250
Severe Storms	102	242	91	126	57	57	114	207	136	146	1,374	1,809	5,348	6,236	91	390	79	90	3,940	3,947	11,354	13,250
Floods	1	2	1	1	3	3	1	2	7	7	69	90	267	312	1	4	1	1	197	197	568	663
Hurricanes	102	242	91	126	57	57	114	207	136	146	1,374	1,809	5,348	6,236	91	390	79	90	3,940	3,947	11,354	13,250
Winter Storms/Freezes	102	242	91	126	57	57	114	207	136	146	1,374	1,809	5,348	6,236	91	390	79	90	3,940	3,947	11,354	13,250
Droughts/Heat Waves	102	242	91	126	57	57	114	207	136	146	1,374	1,809	5,348	6,236	91	390	79	90	3,940	3,947	11,354	13,250
Wildfires	102	242	91	126	57	57	114	207	136	146	1,374	1,809	5,348	6,236	91	390	79	90	3,940	3,947	11,354	13,250
Dam/Levee Failures	1	2	0	0	0	0	0	0	0	0	14	18	53	62	0	0	0	0	39	39	114	133
Landslides	1	2	1	1	1	1	1	2	1	1	14	18	53	62	1	4	1	1	197	197	568	663
Earthquakes	102	242	91	126	57	57	114	207	136	146	1,374	1,809	5,348	6,236	91	390	79	90	3,940	3,947	11,354	13,250
Sinkholes (Land Subsidence)	0	0	1	1	0	0	1	2	0	0	0	0	0	0	1	4	1	1	39	39	114	133
Manmade/Technological	102	242	91	126	57	57	114	207	136	146	1,374	1,809	5,348	6,236	91	390	79	90	3,940	3,947	11,354	13,250

Note: Totals of all municipalities and unincorporated county may not equal Tuscaloosa County totals due to rounding

Critical Facilities

HAZUS-MH estimates there are 92 critical facilities within Tuscaloosa County. The number of critical facilities will increase to approximately 108, according to future estimates. Of the high potential loss facilities, there are 79 dams, 23 identified as high hazard. There are also 107 hazardous materials sites. Dams are expected to increase to approximately 92 and hazardous materials sites to 125.

Table 5-30. HAZUS-MH Essential Facilities Data

Classification	Existing Estimate	Future Estimate
Hospitals	4 (1,735 beds)	4.7 (2,030 beds)
Fire Stations	15	17.6
Police Stations	11	12.9
EOC	1	1.2
Schools	61	71.4

Table 5-31. HAZUS-MH High Potential Loss Facilities Data

Classification	Existing Estimate	Future Estimate
Dams	79	92.4
Hazard Materials Sites	107	125.2
Military Installations	0	0
Nuclear Power Plants	0	0

Infrastructure

Infrastructure inventories appear below. Infrastructure expansion is not directly related to population growth; consequently, no projections are given here. Most of the at-risk transportation system components are highway road segments and bridges, which are most vulnerable to flooding.

Table 5-32. HAZUS-MH Transportation Systems Lifeline Inventory

System	Component	# Locations/Segments	Replacement Value ($ millions)
Highway	Bridges	364	$425.10
	Segments	102	$2,568.80
	Tunnels	0	$0
		Subtotal	***$2,993.90***
Railways	Bridges	5	$.70
	Facilities	3	$8.00
	Segments	22	$128.00
	Tunnels	0	$0
		Subtotal	***$136.60***

System	Component	# Locations/Segments	Replacement Value ($ millions)
Light Rail	Bridges	0	$0
	Facilities	0	$0
	Segments	0	$0
	Tunnels	0	$0
		Subtotal	***$0***
Bus	Facilities	0	$0
		Subtotal	***$0***
Ferry	Facilities	0	$0
		Subtotal	***$0***
Port	Facilities	13	$26.00
		Subtotal	***$26.00***
Airport	Facilities	1	$10.70
	Runways	2	$75.90
		Subtotal	***$86.60***
		Total	**$3,243.10**

The types of utilities most vulnerable to hazards are wastewater treatment plants, water treatment and distribution facilities, and electric power lines and substations. Hurricanes, severe storms, and flooding pose the greatest threat to these facilities.

Table 5-33. HAZUS-MH Utilities Systems Lifeline Inventory

System	Component	# Locations / Segments	Replacement value ($ millions)
Potable Water	Distribution Lines	NA	$105.60
	Facilities	0	$0
	Pipelines	0	$0
		Subtotal	***$105.60***
Waste Water	Distribution Lines	NA	$63.30
	Facilities	3	$179.80
	Pipelines	0	$0
		Subtotal	***$243.20***
Natural Gas	Distribution Lines	NA	$42.20
	Facilities	15	$14.70
	Pipelines	0	$0
		Subtotal	***$56.90***
Oil Systems	Facilities	2	$.20
	Pipelines	0	$0
		Subtotal	***$.20***
Electrical Power	Facilities	3	$297.00
		Subtotal	***$297.00***

System	Component	# Locations / Segments	Replacement value ($ millions)
Communication	Facilities	16	$1.40
		Subtotal	***$1.40***
		Total	**$704.30**

Local Inventories of Critical Facilities and Infrastructure

The following maps and tables show the locations of major critical facilities, including Government Facilities, Public Safety Facilities, Schools, Hospitals and Elderly Care Facilities, Emergency Shelters, Communication Facilities, Warning Sirens, Utilities, Dams/Levees, and Transportation.

Table 5-34. Tuscaloosa County Government Facilities

Agency	Address	City	SIC Description
Adult Vocational Rehab Services	1305 James I Harrison, Jr Pkwy E	Tuscaloosa	Administration of Social and Manpower Programs
AL Alcoholic Beverage Control Board	6050 Mimosa Circle	Tuscaloosa	Regulation, Administration of Transportation
AL Alcoholic Beverage Control Board	401 21st Ave.	Tuscaloosa	Finance, Taxation, and Monetary Policy
AL Alcoholic Beverage Control Board	612 Lurleen B Wallace Blvd.	Tuscaloosa	Regulation, Miscellaneous Commercial Sectors
AL Alcoholic Beverage Control Board	2490 McFarland Blvd.	Northport	Finance, Taxation, and Monetary Policy
Alabama Dept. of Human Resources	3716 12th Ave. E	Tuscaloosa	Administration of Social and Manpower Programs
Alabama Dept. of Public Health Area 3, Administration	1101 Jackson Ave.	Tuscaloosa	Administration of Social and Manpower Programs
Alabama Dept. of Public Health Area 3, Environmental	1200 37th St. E	Tuscaloosa	Administration of Social and Manpower Programs
Alabama Dept. of Public Safety Drivers' License	2645 Skyland Blvd. E	Tuscaloosa	Regulation, Administration of Transportation
Alabama Dept. of Revenue	518 19th Ave.	Tuscaloosa	Finance, Taxation, and Monetary Policy
Alabama Dept. of Transportation	3702 Resource Dr. # 1	Tuscaloosa	Legislative Bodies
Alabama Dept. of Transportation	620 14th St # A	Tuscaloosa	Regulation, Administration of Transportation
Alabama Dept. of Transportation	2715 Skyland Blvd. E	Tuscaloosa	Regulation, Administration of Transportation
Alabama Career Center	2202 Skyland Blvd. E	Tuscaloosa	Finance, Taxation, and Monetary Policy
Alabama Forestry Commission	8135 McFarland Blvd.	Northport	Land, Mineral, and Wildlife Conservation
Alabama Game & Fish Division	8211 Highway 82 W	Northport	Land, Mineral, and Wildlife Conservation
Alabama Health Network	921 3Rd. Ave. E	Tuscaloosa	Administration of Public Health Programs
Alabama State Medicaid Agency	900 22nd Ave. E	Tuscaloosa	Administration of Social and Manpower Programs
Alabama Unemployment Claims-Tax Office	220 222 14th St.	Tuscaloosa	Finance, Taxation, and Monetary Policy
ARC of Tuscaloosa County	1330 University Blvd. E	Tuscaloosa	General Government
Brookwood Town Hall	15689 Alabama 216	Brookwood	Legislative Bodies
Coaling Town Hall	11281 Stephens Loop	Coaling	Legislative Bodies

Agency	Address	City	SIC Description
Coker Town Hall	11549 Eisenhower Dr.	Coker	Legislative Bodies
Geological Survey of Alabama	420 Hackberry Ln.	Tuscaloosa	Regulation, Miscellaneous Commercial Sectors
Northport City Hall	3500 McFarland Blvd.	Northport	Executive Offices
Northport City offices	5410 Alabama 69 N	Northport	Legislative Bodies
Northport City Public Works	1781 Harper Rd.	Northport	Public Order and Safety
Northport Housing Authority Sec 8	39 West Cir.	Northport	Housing Programs
Northport Municipal Court	3721 26th Ave.	Northport	Courts
Tuscaloosa Career Center	202 Skyland Blvd.	Tuscaloosa	Administration of Social and Manpower Programs
Tuscaloosa City Dept. of Transportation	1000 28th Ave.	Tuscaloosa	Regulation, Administration of Transportation
Tuscaloosa City Hall	2201 University Blvd.	Tuscaloosa	Executive Offices
Tuscaloosa City Municipal Court	2122 6th St.	Tuscaloosa	Courts
Tuscaloosa City Offices	2201 University Blvd.	Tuscaloosa	Legislative Bodies
Tuscaloosa City Transit Authority	2450 Hargrove Rd.	Tuscaloosa	Regulation, Administration of Transportation
Tuscaloosa County Cooperative Ext. System	2513 7th St.	Tuscaloosa	Legislative Bodies
Tuscaloosa County Courthouse	714 Greensboro Ave.	Tuscaloosa	Legislative Bodies
Tuscaloosa County District Attorney	714 Greensboro Ave.	Tuscaloosa	Legal Counsel and Prosecution
Tuscaloosa County Engineering	2810 35th St.	Tuscaloosa	Legislative Bodies
Tuscaloosa County Health Department	2350 Hargrove Rd.	Tuscaloosa	Administration of Public Health Programs
Tuscaloosa County Juvenile Court	6001 12th Ave. E	Tuscaloosa	Legislative Bodies
Tuscaloosa County Mental Retardation	1002 McFarland Blvd. # K	Northport	General Government
Tuscaloosa County School System	1118 Greensboro Ave.	Tuscaloosa	Legislative Bodies
Tuscaloosa City Board of Education	1210 21st Ave.	Tuscaloosa	Legislative Bodies
Tuscaloosa Housing Authority	2117 Jack Warner Pkwy., NE	Tuscaloosa	Housing Programs
Tuscaloosa Housing Counseling	2122 6th St.	Tuscaloosa	Legislative Bodies
Tuscaloosa Lakes Division	3650 Lake Nicol Rd.	Tuscaloosa	Legislative Bodies
Tuscaloosa PD Juvenile Program	3801 Trevor S. Phillips Ave.	Tuscaloosa	Legislative Bodies

Agency	Address	City	SIC Description
US Army Corps of Engineers	101 21st Ave.	Tuscaloosa	National Security
US Army Corps of Engineers	12421 Deerlick Rd.	Tuscaloosa	Land, Mineral, and Wildlife Conservation
US Army Corps of Engineers	Rocky Branch Rd.	Cottondale	Land, Mineral, and Wildlife Conservation
US Army Corps of Engineers	11100 Dunns Camp Rd.	Northport	Land, Mineral, and Wildlife Conservation
US Army Corps of Engineers	3801 3rd St. S	Northport	Land, Mineral, and Wildlife Conservation
US Army Corps of Engineers	3955 3rd St. S	Northport	Land, Mineral, and Wildlife Conservation
US Army Corps of Engineers Holt Resource Office	11911 Holt Lock and Dam Rd.	Cottondale	Land, Mineral, and Wildlife Conservation
US Bankruptcy Chapter 13 Trustee	701 22nd Ave.	Tuscaloosa	Legislative Bodies
US Bankruptcy Chapter Trustee	1307 25th Ave.	Tuscaloosa	Legislative Bodies
US Federal Aviation Administration	7508 Robert Cardinal Airport Rd.	Tuscaloosa	Regulation, Administration of Transportation
US Federal Building & Courthouse	2005 University Blvd.	Tuscaloosa	Courts
US General Services Admin, Social Security, FBI	2005 University Blvd.	Tuscaloosa	Social Security Administration
US Geological Survey	1912 6th St.	Tuscaloosa	Air, Water, and Solid Waste Management
US Geological Water Resources	520 19th Ave.	Tuscaloosa	Legislative Bodies
US Housing Authority Federal	570 60th St.	Tuscaloosa	Housing Programs
US Marine Corps officer Selection Station	225 University Blvd. E	Tuscaloosa	National Security
US Natural Resources Conservation, USDA	3831 Palisades Dr.	Tuscaloosa	Land, Mineral, and Wildlife Conservation
US National Weather Service	7504 Robert Cardinal Airport Rd.	Tuscaloosa	Administration of General Economic Programs
USGS Alabama Water Science Center	411 Hackberry Lane, Biology Building	Tuscaloosa	Air, Water, and Solid Waste Management
Vance Town Hall	17710 Vance Municipal Dr. (18336 US 11)	Vance	Executive Offices
West Alabama Planning & Development Council	4200 Highway 69 N	Northport	Urban and Community Development

Map 5-25. Tuscaloosa County Government Facilities

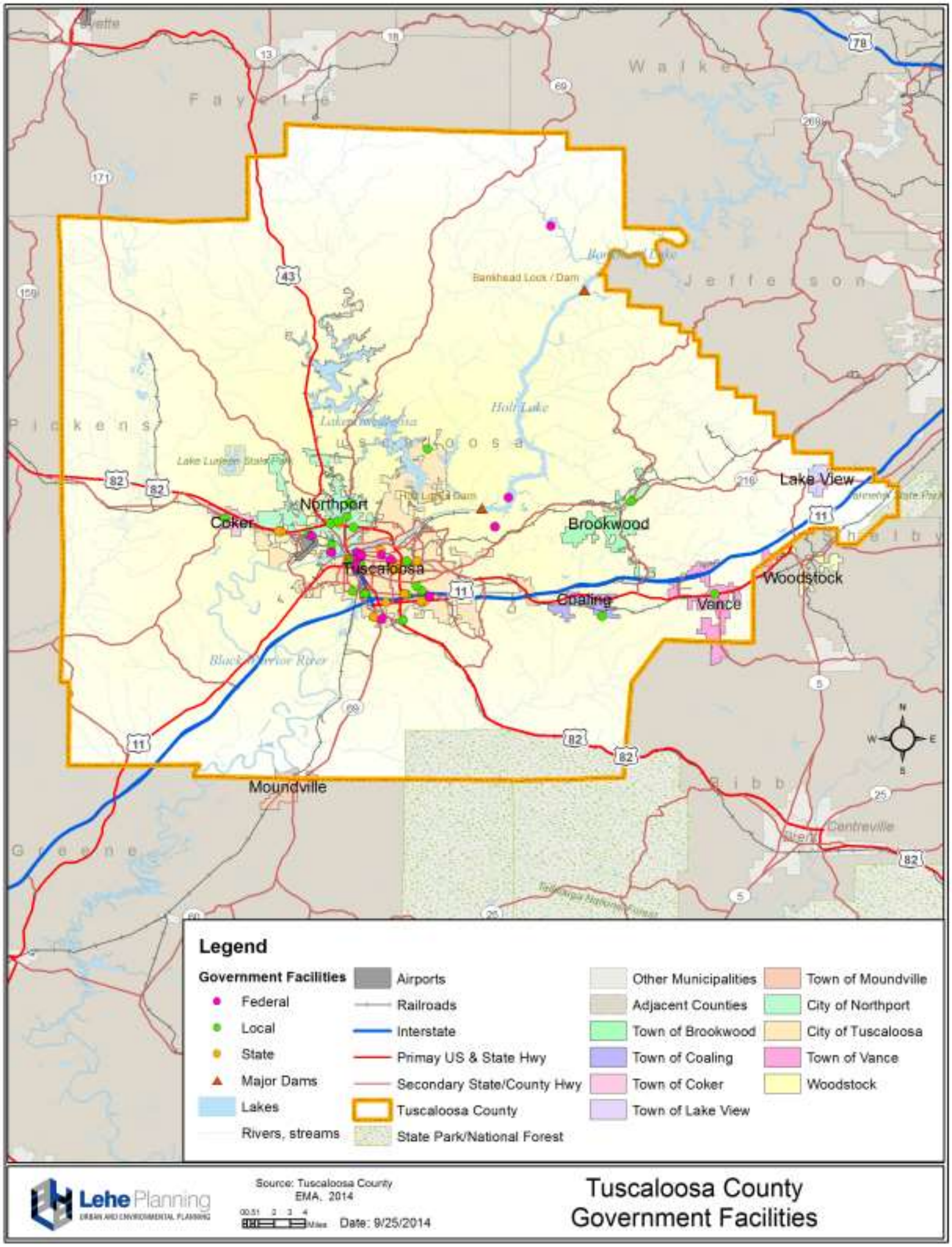


Table 5-35. Tuscaloosa County Public Safety Facilities

Name	Address	City	Zip
Alabama State Trooper	2645 Skyland Blvd. E	Tuscaloosa	35405
Antioch Volunteer Fire Dept.	16367 Antioch Community Rd	Brookwood	35444
Brookwood Police Dept.	15689 Highway 216	Brookwood	35444
Brookwood Volunteer Fire Dept. Station 1	15689 Highway 216	Brookwood	35444
Brookwood Volunteer Fire Dept. Station 2	10650 George Newell Rd	Brookwood	35490
Carroll's Creek Volunteer Fire Dept. Station 1	14452 Firehouse Rd	Northport	35476
Carroll's Creek Volunteer Fire Dept. Station 2	11604 Stonehenge Rd	Northport	35475
Carroll's Creek Volunteer Fire Dept. Station 3	12165 Knoll Rd	Northport	35475
Coaling Police Department	11281 Stephens Loop Road	Coaling	35453
Coaling Volunteer Fire Department Station 1	15150 Highway 11 N	Coaling	35453
Coaling Volunteer Fire Dept.	11281 Stephens Loop	Coaling	35453
Coaling Volunteer Fire Dept. Station 3	13950 Keenes Mill Road	Coaling	35453
Coker Volunteer Fire Dept.	14600 Highway 140	Coker	35452
Duncanville Volunteer Fire Dept.-Monticello station	11340 Monticello Dr.	Duncanville	35456
Duncanville Volunteer Fire Dept. Southfork Station	11690 South Fork Drive	Duncanville	35456
Duncanville Volunteer Fire Dept. Englewood Station	13970 Old Greensboro Rd.	Tuscaloosa	35405
Echola Volunteer Fire Dept.	14690 Echola Road	Gordo	35466
Fosters-Ralph Volunteer Fire-Fosters	14661 Gainesville Rd	Fosters	35463
Fosters-Ralph Volunteer Fire-Ralph	17119 Ralph Loop Rd	Ralph	35480
Hagler Volunteer Fire Dept.	15451 Hagler Coaling Road	Duncanville	35456
Lakeview Fire Protection District Station 1	21289 Phyllis Dr.	Lake View	35111
Lakeview Fire Protection District Station 2	22806 Bucksville Road	McCalla	35111
Lakeview Police Dept.	22757 Central Park Drive	McCalla	35111
Mayfield Volunteer Fire Dept.	19572 Hwy. 171	Fayette	35555
Montgomery Volunteer Fire Dept. Station 1	16780 Morman Rd.	Northport	35475

Name	Address	City	Zip
Montgomery Volunteer Fire Dept. Station 2	15010 Jackson Trace Rd	Coker	35452
Mount Olive Fire Protection District	13322 Mount Olive Rd.	Coker	35452
Nicol Volunteer Fire Dept.	14105 Old Lock 15 Rd.	Tuscaloosa	35406
Northport Fire and Rescue Station 1	3500 McFarland Blvd	Northport	35476
Northport Fire and Rescue Station 2	5410 Hwy 69 N	Northport	35473
Northport Fire and Rescue Station 3	1099 M L King Jr. Blvd.	Northport	35476
Northport Fire and Rescue Station 4	4900 Rose Blvd	Northport	35475
Northport Police Dept.	3721 26th Ave.	Northport	35473
Romulus Volunteer Fire Dept.	16500 Romulus Rd.	Buhl	35446
Samantha Volunteer Fire Dept. Station 1	12995 Northside Rd	Northport	35475
Samantha Volunteer Fire Dept. Station 2	17500 Finnell Road	Northport	35475
Sipsey Valley Volunteer Fire Dept.-Buhl Station 1	16000 block of Sipsey Valley Rd N	Buhl	35446
Sipsey Valley Volunteer Fire Dept. Elrod Station # 2	11000 block of Malone Creek Rd	Elrod	--
Tuscaloosa City Fire & Rescue Service	2201 University Blvd.	Tuscaloosa	35401
Tuscaloosa City Fire Station # 1 & # 5	1501 Greensboro Avenue	Tuscaloosa	35401
Tuscaloosa City Fire Station # 2	322 Paul Bryant Dr.	Tuscaloosa	35401
Tuscaloosa City Fire Station # 3	202 Rice Valley Rd. NE	Tuscaloosa	35406
Tuscaloosa City Fire Station # 4	717 21st Avenue East	Tuscaloosa	35404
Tuscaloosa City Fire Station # 6	3029 Loop Rd.	Tuscaloosa	35405
Tuscaloosa City Fire Station # 7	105 Skyland Blvd.	Tuscaloosa	35405
Tuscaloosa City Fire Station # 8	2200 Eutaw Highway	Tuscaloosa	35401
Tuscaloosa City Fire Station # 9	3942 Woodland Forest Dr.	Tuscaloosa	35405
Tuscaloosa City Fire Station # 10	8101 New Watermelon Rd.	Tuscaloosa	35406
Tuscaloosa City Fire Station # 11	10293 Covered Bridge Rd.	Cottondale	35453
Tuscaloosa City Fire Station # 12	7515 Robert Cardinal Airport Rd.	Tuscaloosa	35406

Name	Address	City	Zip
Tuscaloosa City Police Dept.	3801 Trever S. Phillips Ave	Tuscaloosa	35401
Tuscaloosa City Police Headquarters	3801 Millcreek Ave.	Tuscaloosa	35401
Tuscaloosa Police Dept. East Precinct	2201 University Blvd	Tuscaloosa	35404
Tuscaloosa Police Dept. West Precinct	1501 Culver Road	Tuscaloosa	35401
Tuscaloosa City Police Homicide Unit	714 1/2 Greensboro Ave	Tuscaloosa	35401
Tuscaloosa City Police-Air Patrol	7505 Robert Cardinal Airport Rd.	Tuscaloosa	35401
Tuscaloosa City Police-Firing Range	2101 New Watermelon Rd.	Tuscaloosa	35406
Tuscaloosa City Police-Traffic Ticket	2122 6th Street	Tuscaloosa	35401
Tuscaloosa Co Communication District E911	2501 7th St.	Tuscaloosa	35401
Tuscaloosa Co Corrections	3130 35th St.	Tuscaloosa	35401
Tuscaloosa Co Emergency Management	2105 McFarland Blvd E	Tuscaloosa	35404
Tuscaloosa Co Sheriff's Office	714 1/2 Greensboro Ave.	Tuscaloosa	35401
Tuscaloosa County Jail	1600 26th Ave.	Tuscaloosa	35401
Tuscaloosa Sheriff's Office	714 1/2 Greensboro Ave.	Tuscaloosa	35401
University of Alabama Police	1110 Jackson Ave.	Tuscaloosa	35401
Vance Police Dept.	17710 Vance Municipal Drive	Vance	35490
Vance Volunteer Fire Department Station 1	10902 Public Safety Dr.	Vance	35490
Vance Volunteer Fire Dept. Station 2	17788 Wallace Chapel Rd.	Vance	35490
Wiley Volunteer Fire Dept.	10807 Willcutt Road	Berry	35546
Yellow Creek Volunteer Fire Dept.	10722 Watermelon Rd.	Tuscaloosa	35406

Map 5-26. Tuscaloosa County Public Safety Facilities

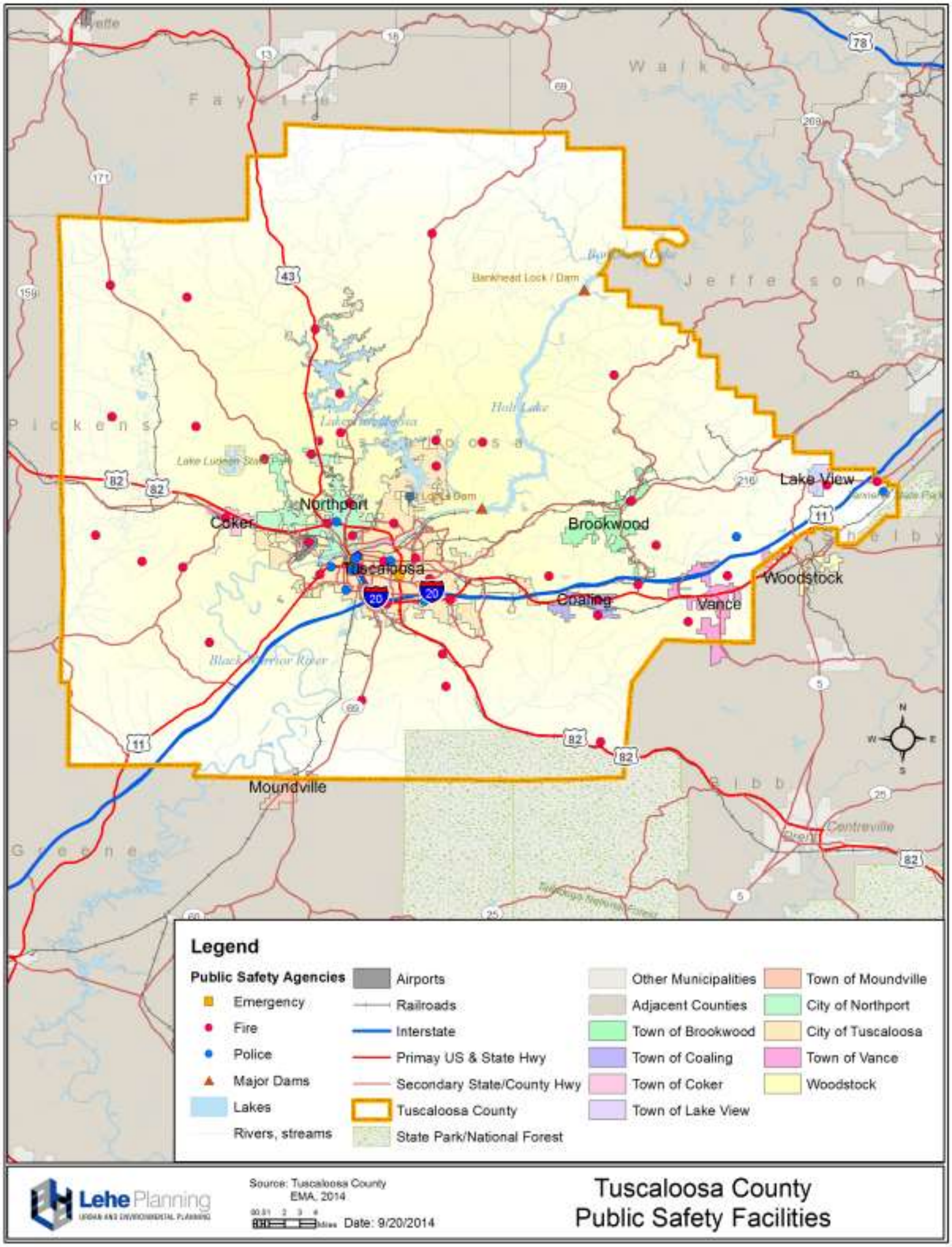


Table 5-36. Tuscaloosa County Schools

Name	Address	City	Zip	# of Students
Alabama Fire College	2501 Phoenix Dr.	Tuscaloosa	35405	--
Alberta Elementary School	315 McFarland Blvd. E	Tuscaloosa	35404	540
American Christian Academy	2300 Veterans Memorial Pkwy.	Tuscaloosa	35404	892
Arcadia Elementary School	3740 Arcadia Dr.	Tuscaloosa	35404	392
Brewer Porch Children's Center	2501 Woodland Rd.	Tuscaloosa	35487	451
Brookwood Elementary School	16049 Highway 216	Brookwood	35444	982
Brookwood High School	12250 George Richmond Pkwy.	Brookwood	35444	816
Brookwood Middle School	17021 Brookwood Pkwy.	Vance	35490	759
Buhl Elementary School	11968 Buhl School Rd.	Buhl	35446	193
Capitol School The	2828 6th St.	Tuscaloosa	35401	82
Centec Training Center	3401 Martin L King Jr Blvd.	Tuscaloosa	35401	--
Central High School West	1715 Martin L King Jr Blvd.	Tuscaloosa	35401	623
Central Primary School	1510 30th Ave.	Tuscaloosa	35401	257
Collins-Riverside Middle School	1400 3rd St.	Northport	35476	357
Cottondale Elementary School	2301 Cottondale Ln.	Cottondale	35453	462
Crestmont Elementary School	2400 34th Ave.	Northport	35476	277
Davis-Emerson Middle School	1550 Prudes Mill Rd.	Cottondale	35453	460
Eastwood Middle School	6314 Mary Harmon Bryant Dr.	Cottondale	35453	968
Echols Middle School	2701 Echols Ave.	Northport	35476	517
Englewood Elementary School	10300 Old Greensboro Rd.	Tuscaloosa	35405	604
Faucett-Vestavia Elementary School	1150 Vestavia Cir.	Northport	35473	421
Flatwoods Elementary School	3800 66th Ave.	Northport	35473	293
Hillcrest High School	300 Patriot Pkwy.	Tuscaloosa	35405	1207
Hillcrest Middle School	401 Hillcrest School Rd.	Tuscaloosa	35405	955
Holt Elementary School	1001 Crescent Ridge Rd.	Holt	35404	420
Holt High School	3801 Alabama Ave. Ne	Holt	35404	460

Name	Address	City	Zip	# of Students
Holy Spirit Elementary School	601 James I Harrison Jr E	Tuscaloosa	35405	242
Holy Spirit High School	711 James I Harrison Jr E	Tuscaloosa	35405	555
Huntington Place Elementary School	11601 Huntington Place	Northport	35475	709
Lloyd Wood Middle School	2300 26th Ave.	Northport	35476	540
Martin L King Jr Elementary School	2430 Martin L King Jr Blvd.	Tuscaloosa	35401	444
Matthews Elementary School	1225 Rice Mine Rd.	Northport	35476	404
Maxwell Elementary School	11370 Monticello Dr.	Duncanville	35456	528
Myrtlewood Elementary School	14701 Gainsville Rd.	Fosters	35463	236
Night High School	1715 Martin Luther King Jr Blvd.	Tuscaloosa	35401	514
Northington Elementary School	1300 21St St. E	Tuscaloosa	35404	379
Northridge High School	2901 Northridge Rd.	Tuscaloosa	35406	1097
Northside High School	19230 Northside Parkway	Northport	35475	383
Northside Middle School	19130 Northside Parkway	Northport	35475	351
Oak Hill School	2501 Hargrove Rd. E	Tuscaloosa	35405	129
Oakdale Primary School	5001 25Th St.	Tuscaloosa	35401	227
Open Door Christian School	1785 McFarland Blvd. N	Tuscaloosa	35406	174
Paul W Bryant High School	6315 Mary Harmon Bryant Dr.	Cottondale	35453	1038
Rock Quarry Elementary School	2000 Rock Quarry Dr.	Tuscaloosa	35406	526
Rock Quarry Middle School	2100 Rock Quarry Dr.	Tuscaloosa	35406	--
Shelton State Community College	9500 Old Greensboro Rd.	Tuscaloosa	35405	5307
Sherwood Forest Kindergarten	2928 Hargrove Rd. E	Tuscaloosa	35405	--
Skyland Elementary School	408 Skyland Blvd. E	Tuscaloosa	35405	571
Skyland SDA School	2211 Skyland Blvd. E	Tuscaloosa	35405	7
Southview Elementary School	2601 Southview Dr.	Tuscaloosa	35405	--
Southview Middle School	2605 Southview Dr	Tuscaloosa	35405	--
Sprayberry Regional Education Center	1324 Rice Mine Rd.	Northport	35476	61
Stillman College	3601 Stillman Blvd.	Tuscaloosa	35401	1072

Name	Address	City	Zip	# of Students
Stillman Heights Elementary	3834 21st St.	Tuscaloosa	35401	--
Taylorville Primary School	350 Bobby Miller Pkwy.	Tuscaloosa	35405	679
This Olde House	22628 Bucksville Rd.	McCalla	35111	64
Tuscaloosa Academy	420 Rice Valley Rd. N	Tuscaloosa	35406	349
Tuscaloosa Alternative School	7 Nunnelley Dr.	Tuscaloosa	35404	--
Tuscaloosa Career & Technology Academy	2800 Martin L King Jr Blvd.	Tuscaloosa	35401	514
Tuscaloosa Christian School	1601 Prude Mill Rd.	Cottondale	35453	267
Tuscaloosa County High School	12500 Wildcat Dr.	Northport	35475	1711
Tuscaloosa Middle School	315 McFarland Blvd. E	Tuscaloosa	35404	972
Tuscaloosa Regional Detention Center	6001 12th Ave. E	Tuscaloosa	35405	514
University Of Alabama	400 Mcorvey Dr.	Tuscaloosa	35487	34852
University Place Montessori School	2000 First Ave.	Tuscaloosa	35401	610
University Place Middle School	2010 First Ave.	Tuscaloosa	35401	--
Vance Elementary School	18202 Hwy. 11 N	Vance	35490	508
Verner Elementary School	2701 N Ridge Rd.	Tuscaloosa	35406	542
Walker Elementary School	13051 Northside Rd.	Northport	35475	659
Westlawn Middle School	1715 Martin L King Jr Blvd.	Tuscaloosa	35401	528
Westwood Elementary School	11629 Westwood School Rd.	Coker	35452	348
Woodland Forrest Elementary School	6001 E Hargrove Rd.	Tuscaloosa	35405	601

Map 5-27. Tuscaloosa County Schools

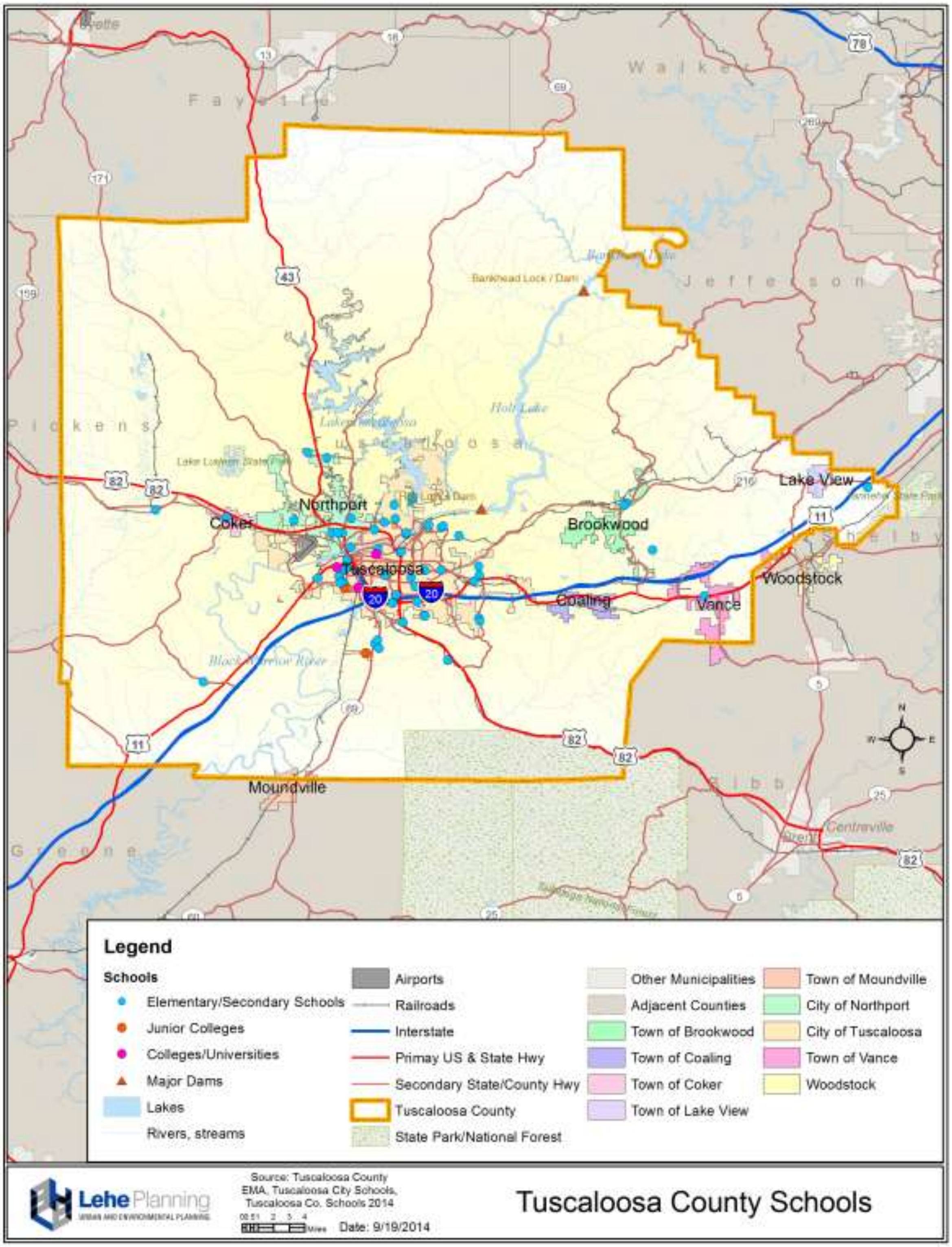


Table 5-37. Tuscaloosa County Hospital and Elderly Care Facilities

Name	Description	Address	City	Zip
Alabama Comprehensive Treatment	Psychiatric Hospitals	661 Helen Keller Blvd. # B	Tuscaloosa	35404
Alabama Tuscaloosa Treatment	Specialty Hospitals, Except Psychiatric	1001 Mimosa Park Rd.	Tuscaloosa	35405
Andante Group Home	Psychiatric Care	532 Frank Thomas Ave.	Tuscaloosa	35401
Bradford Health Services	Chemical Dependency Treatment Facility	515 Energy Center Blvd.	Northport	35473
Bradford Health Services	Chemical Dependency Treatment Facility	1918 University Blvd	Tuscaloosa	35401
Bryce Hospital	Psychiatric Hospitals	1651 Ruby Tyler Pkwy	Tuscaloosa	35401
Burton School Inc.	Residential Care	3807 1st Ave.	Tuscaloosa	35405
Capstone Village	Dementia Unit/Assisted Living/Independent Living	601 5th Avenue East	Tuscaloosa	35401
DCH Regional Medical Center	General Medical and Surgical Hospitals	809 University Blvd. E	Tuscaloosa	35401
Estes Park Manor	Skilled Nursing Care Facilities	2201 Hwy 82 Bypass	Northport	35476
Forest Manor Nursing Home	Skilled Nursing Care Facilities	2215 32nd St	Northport	35476
Glen Haven Health & Rehab.	Skilled Nursing Care Facilities	2201 32nd St.	Northport	35476
Hambrick Highlands Assisted Living	Assisted Living	755 55th Pl. E	Tuscaloosa	35405
Harper Center	General Medical and Surgical Facilities	200 University Blvd.	Tuscaloosa	35401
Heritage Health Care & Rehab.	Skilled Nursing Care Facilities	1101 Snows Mill Ave.	Tuscaloosa	35406
Hospice of West Alabama Inc.	Nursing and Personal Care	3851 Loop Rd.	Tuscaloosa	35404
Indian Rivers Community Mental Health	Community Mental Health	2209 9th Street	Tuscaloosa	35401
Magnolia Place	Mental Health & Substance Abuse Facility	3715 3rd Ave. E	Tuscaloosa	35405
Martinview Assisted Living	Assisted Living Facility	2015 32nd St.	Northport	35476
Merrill Gardens at Northport	Residential Care	951 Rose Dr.	Northport	35476
Morning Pointe of Tuscaloosa	Assisted Living Facility & Alzheimer's Memory Care	1801 Rice Mine Rd. N	Tuscaloosa	35406
North Harbor Pavilion	Psychiatric Hospitals	2700 Hospital Dr.	Northport	35476
North River Village	Retirement Community/Assisted Living	5810 Rice Mine Rd. NE	Tuscaloosa	35406

Name	Description	Address	City	Zip
Northport Health & Rehab. LLC	Skilled Nursing Care Facilities	600 34th St.	Northport	35476
Northport Health Services	Skilled Nursing Care Facilities	931 Fairfax Park	Tuscaloosa	35406
Northport Hospital -DCH System	General Medical and Surgical Hospitals	2700 Hospital Dr.	Northport	35476
Park Manor Health & Rehab. LLC	Skilled Nursing Care Facilities & Rehab	2201 McFarland Blvd.	Northport	35476
Pine Valley Retirement Community	Residential Care	800 Rice Valley Rd. N	Tuscaloosa	35406
Regency Retirement Center	Alzheimer's Care & Services	5001 Old Montgomery Hwy.	Tuscaloosa	35405
Smithcare Inc.	Mental Health & Substance Abuse Facility	6133 Birchwood Ave.	Tuscaloosa	35405
Taylor Hardin Secure Medical Facility	Secure Medical -Mental Health	1301 Jack Warner Pkwy. NE	Tuscaloosa	35404
The Phoenix House	Residential Care	700 35th Ave.	Tuscaloosa	35401
Therapeutic Programs Inc.	Residential Care--Foster Care	3076 Palisades Ct.	Tuscaloosa	35405
US Veterans Medical Center	Psychiatric Hospital/Diagnostic	3701 Loop Rd.	Tuscaloosa	35404
William D Partlow Developmental Center	Psychiatric Hospital	1700 University Blvd E	Tuscaloosa	35404
Wyatt Lynn Foster Home	Residential Care-Group Home	11643 S Rosser Rd.	Tuscaloosa	35405

Map 5-28. Tuscaloosa County Hospitals and Elderly Care Facilities

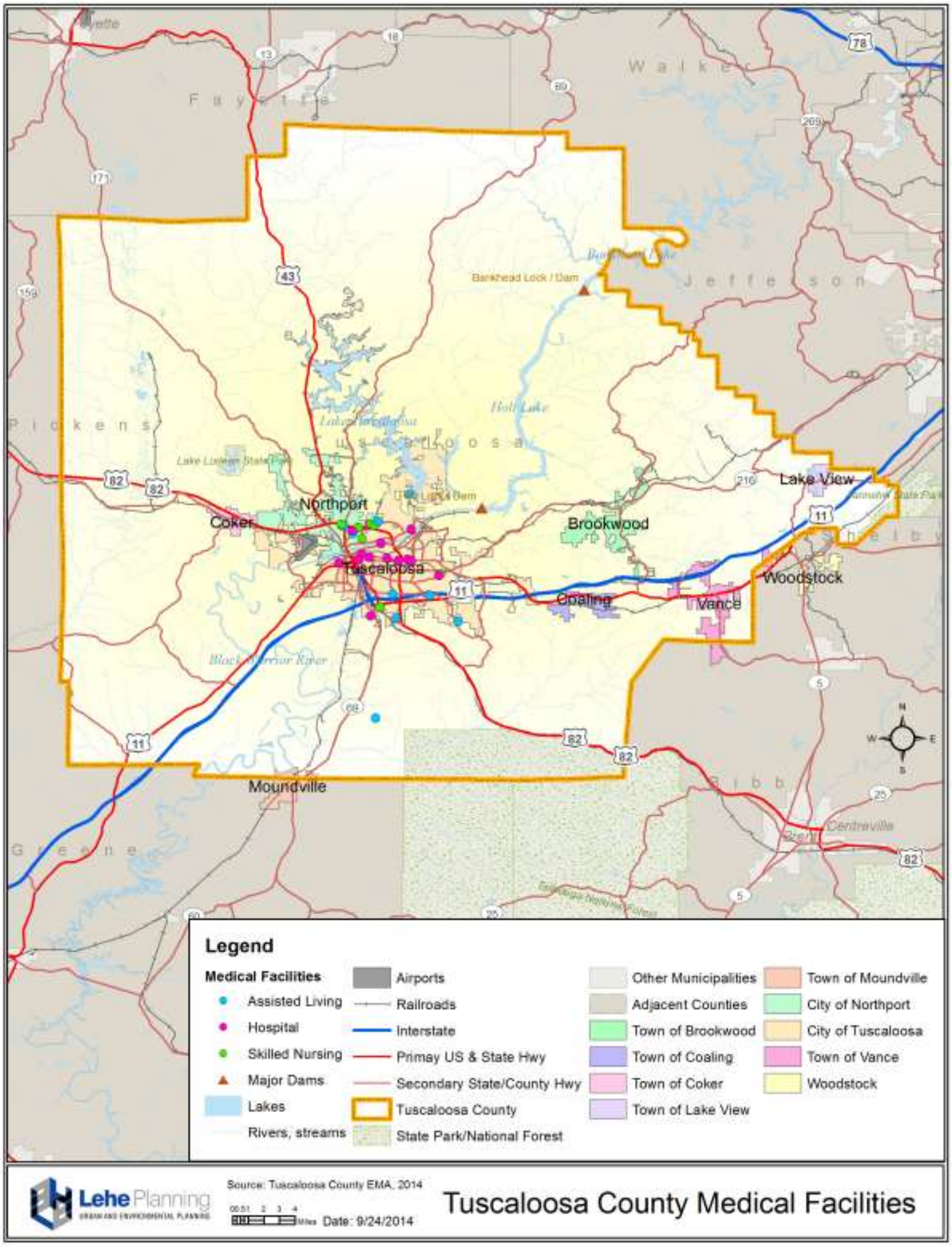


Table 5-38. Tuscaloosa County Utilities

Name	Address	City	Facility Type
ABM Recycling	5901 12th Ave. E	Tuscaloosa	Solid Waste
Alabama Power Bankhead Dam	19001 Lock 17 Rd.	Northport	Electric
Alabama Power Company	2200 4th St.	Tuscaloosa	Electric
Alabama Power Company	400 McFarland Blvd Ste. D	Northport	Electric
Alabama Power Holt Hydro Plant	12117 Power Plant Rd.	Tuscaloosa	Electric
Alabama Power-West Div. Garage	1301 Snows Mill Rd.	Tuscaloosa	Electric
Alagasco Operation Center	5220 Metro Park Dr.	Tuscaloosa	Gas Oil
Black Warrior Methane	17100 Methane Ln.	Brookwood	Gas Oil
Black Warrior Solid Waste Authority	3301 Landfill Dr.	Coker	Solid Waste
Black Warrior Transmission	16243 Highway 216	Brookwood	Gas Oil
Blount Recycling LLC	6345 Old Montgomery Hwy.	Tuscaloosa	Solid Waste
Buhl-Elrod-Holman Water Authority	11965 Sipsey Valley Rd. N	Buhl	Water-Wastewater
Carrolls Creek Water Authority	14462 Firehouse Rd.	Northport	Water-Wastewater
Citizens Water Service Inc.	16773 Highway 11 N	Vance	Water-Wastewater
Coaling Water Authority	11224 Hagler Coaling Rd.	Coaling	Water-Wastewater
Coker Water Authority	11556 Eizenhower Dr.	Coker	Water-Wastewater
Cypress Creek Inc. Landfill	6315 12th Ave. E	Tuscaloosa	Solid Waste
Dowdle Gas Co	2523 University Blvd.	Tuscaloosa	Gas Oil
Ed Love Filter Plant	1125 Jack Warner Pkwy NE	Tuscaloosa	Water-Wastewater
Enbridge Pipelines	13688 Highway 82 E	Duncanville	Gas Oil
Enbridge Pipelines	13969 Bear Creek Rd.	Duncanville	Gas Oil
Energen Resources	17300 Brookwood Pkwy.	Vance	Gas Oil
Energen Resources	10899 Taurus Rd.	Cottondale	Gas Oil
Englewood-Hulls Water System	11276 Crocker Dr.	Tuscaloosa	Water-Wastewater
Fosters-Ralph Water Authority	17109 Ralph Loop Rd.	Ralph	Water-Wastewater
Hayes Waste Oil Service Inc.	7827 Dottie Dr.	Cottondale	Solid Waste
Heritage Environmental Services	11264 Woodbank Pkwy.	Tuscaloosa	Solid Waste
Hunt Refining Company	1855 Fairlawn Rd.	Tuscaloosa	Gas Oil
Jerry Plott Water Treatment Plant	2101 New Watermelon Rd.	Tuscaloosa	Water-Wastewater
L C Harris & Son Roll Office	13338 Lucios Rd.	Ralph	Solid Waste
Merichem Chemicals - Refinery Services	2701 Warrior Rd.	Tuscaloosa	Gas Oil
Mitchell Water System Inc.	11389 Monticello Dr.	Duncanville	Water-Wastewater
Northport Wastewater Treatment	3950 3rd St. S	Northport	Water-Wastewater
Northport Water Department	3500 McFarland Blvd.	Northport	Water-Wastewater
Northport Water Treatment Plant	11408 Lary Lake Rd.	Northport	Water-Wastewater
Oliver Lock & Dam Office	3955 3rd St. S	Northport	Water-Wastewater
Onyx Eagle Bluff Landfill	4701 12th St. NE	Tuscaloosa	Solid Waste
Peterson Water Works	12926 Deacon St.	Cottondale	Water-Wastewater

Name	Address	City	Facility Type
Rumsey Environmental LLC.	5400 Kauloosa Ave.	Tuscaloosa	Solid Waste
Rumsey Sanitation	1407 10th Ave.	Tuscaloosa	Solid Waste
Sand Springs Water Authority	13951 Highway 171	Northport	Water-Wastewater
Southern Natural Gas	13493 Deerlick Rd.	Tuscaloosa	Gas Oil
Southern Natural Gas Co	13987 Bear Creek Rd.	Duncanville	Gas Oil
Southern Natural Gas Co	9001 Energy Ln.	Northport	Gas Oil
Southern Natural Gas-McConnell	17828 Mormon Rd.	Northport	Gas Oil
Tuscaloosa City Wastewater Plant	3900 Kauloosa Ave.	Tuscaloosa	Water-Wastewater
Tuscaloosa City Water & Sewer Dept.	2201 University Blvd.	Tuscaloosa	Water-Wastewater
Tuscaloosa City Water & Sewer Dept.	2621 Old Kaulton Rd.	Tuscaloosa	Water-Wastewater
Tuscaloosa City Water & Sewer Dept.	2230 6th St.	Tuscaloosa	Water-Wastewater
Tuscaloosa County Solid Waste Dept.	714 Greensboro Ave.	Tuscaloosa	Solid Waste
Tuscaloosa Environmental Services	3440 Kauloosa Ave.	Tuscaloosa	Solid Waste
Waste Management	3150 35th St.	Tuscaloosa	Solid Waste
Waste Management	5404 Kauloosa Ave.	Tuscaloosa	Solid Waste
West Alabama Sanitation	4223 Hargrove Rd. E	Tuscaloosa	Solid Waste

Map 5-29. Tuscaloosa County Utilities

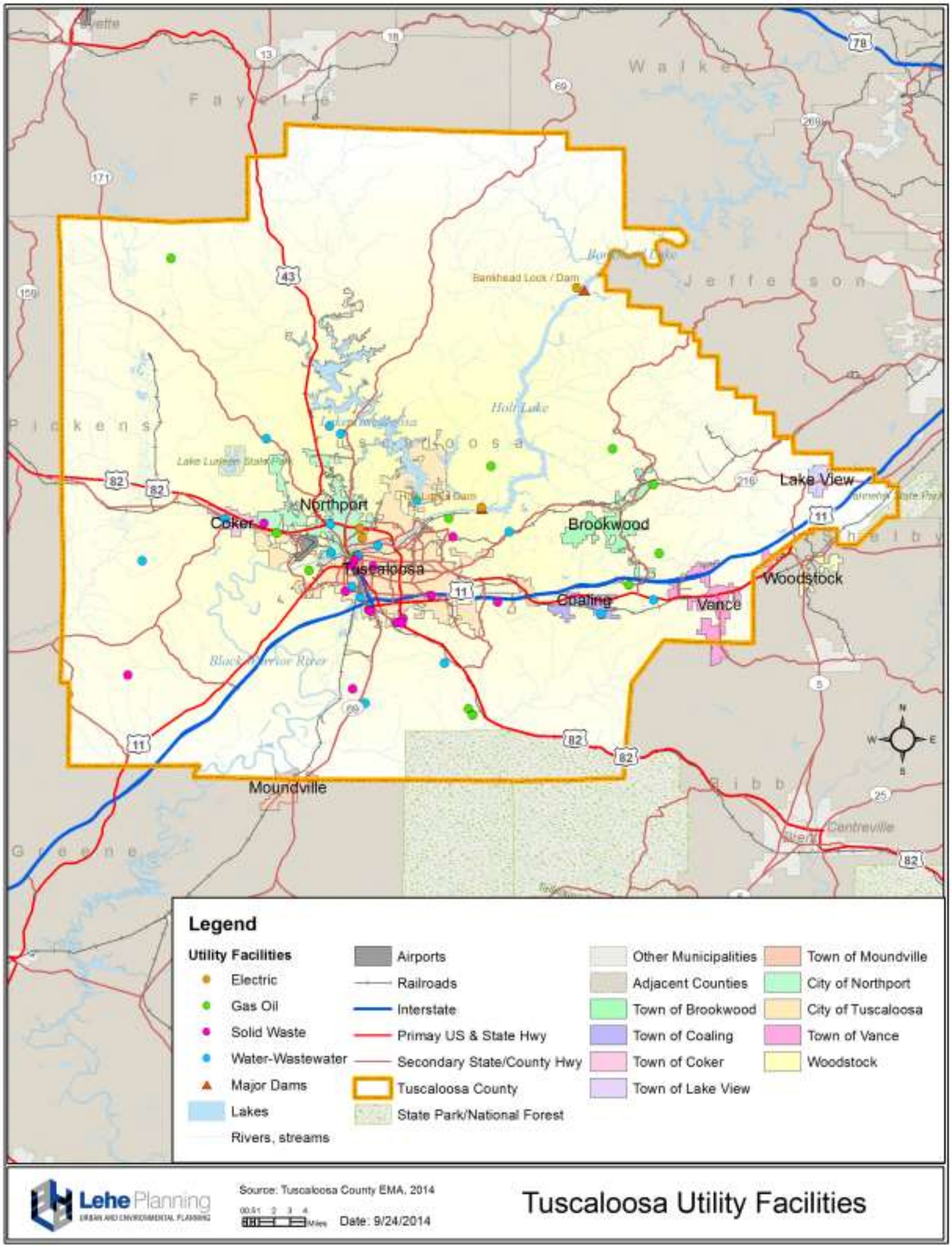


Table 5-39. Tuscaloosa County Communication Facilities

Name	Address	City	Zip
Apex Broadcasting	5200 Flatwoods Rd.	Northport	35473
Apex Communications Inc.	101 Springbrook	Tuscaloosa	35405
Avaya Communication	3500 Skyland Blvd. E	Tuscaloosa	35405
BellSouth	2101 7th St.	Tuscaloosa	35401
Busby Communications Inc.	1700 Dauphine Dr.	Tuscaloosa	35406
Cablesouth	3380 US Hwy 82 W Ste. 8	Northport	35476
Charter Communications	440 Patriot Pkwy.	Tuscaloosa	35405
Charter Media	2306 11th St.	Tuscaloosa	35401
Comcast Cable	6000 McFarland Blvd. E	Tuscaloosa	35406
Comcast Cable	700 14th St.	Tuscaloosa	35401
Comcast Satellite Communications	1120 35th St Ste. C	Tuscaloosa	35401
Crown Castle Communications	14063 Valley Rd.	Northport	35475
Crown Castle Communications	11622 Bama Rock Garden Rd.	Vance	35490
Earle Communications Cable TV	3115 25th Ave Ste. A	Tuscaloosa	35401
Kubiszyn Communications LLC	1203 Dublin Cir.	Tuscaloosa	35406
Lawson Radio of Tuscaloosa Inc.	7741 Woodlawn Cir.	Tuscaloosa	35405
Lewis Communications Inc.	2318 University Blvd.	Tuscaloosa	35401
News Media Corp	216 McFarland Cir. N	Tuscaloosa	35406
Radio South Management	1800 McFarland Blvd. N	Tuscaloosa	35406
Rives Monteiro Engineering LLC	2736 Southside Dr.	Tuscaloosa	35401
Southern Telecom Group	5645 Montpelier Dr.	Tuscaloosa	35405
WACT-Am 1420	1848 McFarland Blvd.	Northport	35476
WBEI FM 101.7/WANZ-FM 100.7	142 Skyland Blvd.	Tuscaloosa	35405
WBRC-TV NBC 13	2330 University Blvd.	Tuscaloosa	35401
WCFT-TV CH 33 ABC	2123 9th St.	Tuscaloosa	35401
WDGM FM 991	5455 Jug Factory Rd.	Tuscaloosa	35405
WLXY FM 100.7	3330 Main Ave.	Northport	35476
WQZZ	601 Greensboro Ave. # 507	Tuscaloosa	35401
WRTR FM 288	3900 11th Ave.	Tuscaloosa	35401
WTBC AM 1230	2110 McFarland Blvd. E	Tuscaloosa	35404
WTUG-FM 225/WTSK AM 790	142 Skyland Blvd.	Tuscaloosa	35405
WTXT FM 98.1	3900 11th Ave.	Tuscaloosa	35401
WVUA TV	920 Paul W Bryant Dr.	Tuscaloosa	35401
WWPG FM 104.3/AM 1280	601 Greensboro Ave.	Tuscaloosa	35401

Map 5-30. Tuscaloosa County Communication Facilities

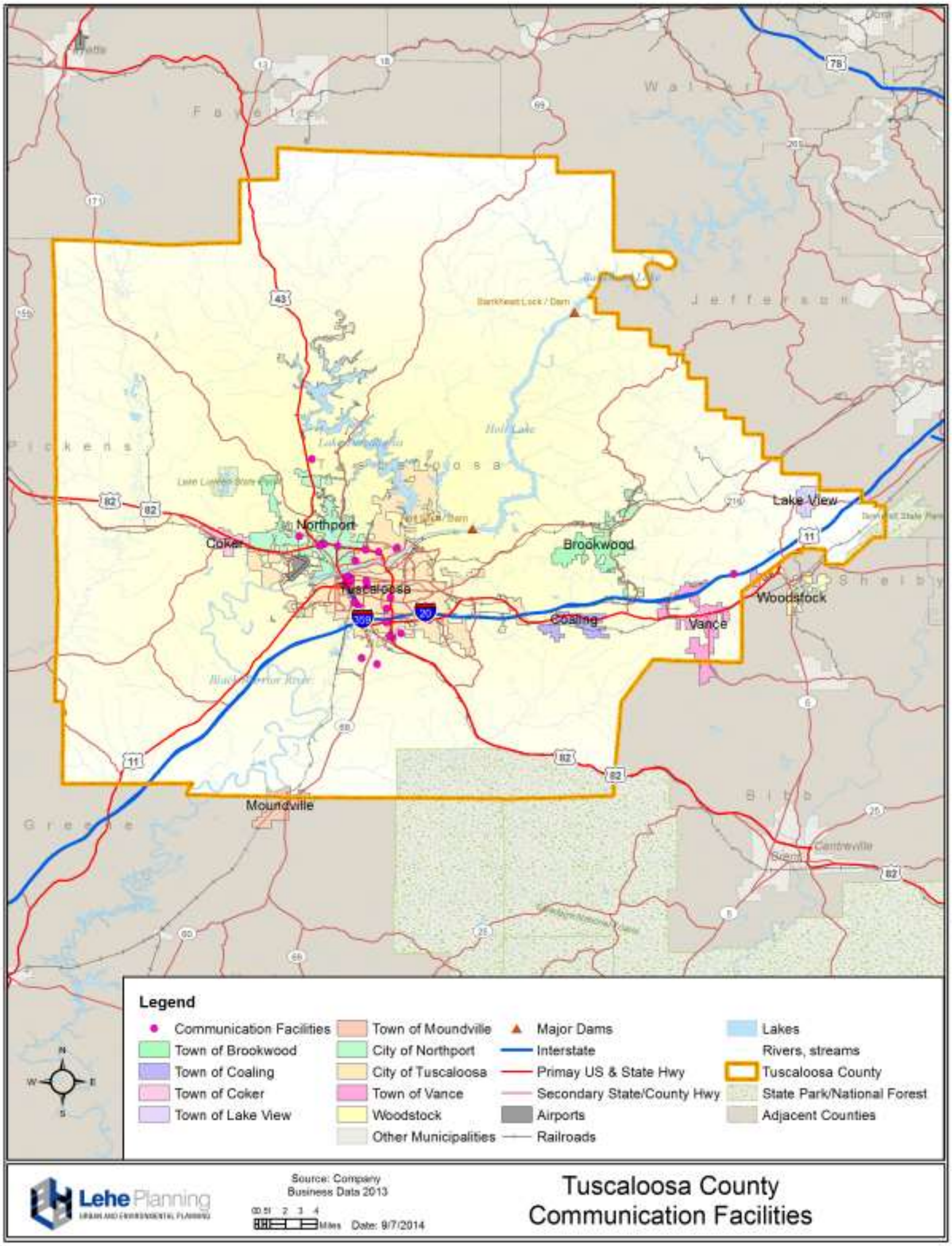


Table 5-40. Tuscaloosa County Emergency Shelters

Facility	Address	City	Zip
Alberta Elementary School	2700 University Blvd E	Tuscaloosa	35404
Big Sandy Elementary	11950 Upper Hulls Rd	Moundville	35474
Brookwood High School	12250 George Richmond Pkwy	Brookwood	35444
Buhl Elementary School	11968 Buhl School Rd.	Buhl	35446
Carrolls' Creek VFD Community Safe Room	11580 Lary Lake Rd.	Northport	35475
City Hall Shelter	2201 University Blvd.	Tuscaloosa	35401
Echola Community Safe Room	14908 Echola Rd.	Gordo	35466
Holt Elementary School	1001 Crescent Ridge Rd	Holt	35404
McDonald Hughes Community Safe Room	3101 Martin Luther King, Jr. Blvd.	Tuscaloosa	35401
T-DOT Shelter	1000 28th Ave.	Tuscaloosa	35401
Town of Brookwood Community Safe Room	15689 Hwy 216	Brookwood	35444
Town of Brookwood Community Safe Room	15689 Hwy 216	Brookwood	35444
Town of Coaling Community Safe Room	11281 Stephens Loop	Coaling	35453
Town of Coaling Community Safe Room	15100 Stonegate Dr.	Coaling	35453
Town of Coaling Community Safe Room	15150 Hwy 11 N	Coaling	35453
Town of Coker Community Safe Room	11556 Eizenhower Dr.	Coker	35242
Town of Vance Community Safe Room	17710 Vance Municipal Dr.	Vance	35490
Tuscaloosa Career & Technology Academy	2800 Martin L King Jr Blvd	Tuscaloosa	35401
University Place Montessori School	2000 First Ave	Tuscaloosa	35401
Yellow Creek VFD Community Safe Room	16040 Yellow Creek Rd	Tuscaloosa	35406

Map 5-31. Tuscaloosa County Emergency Shelters

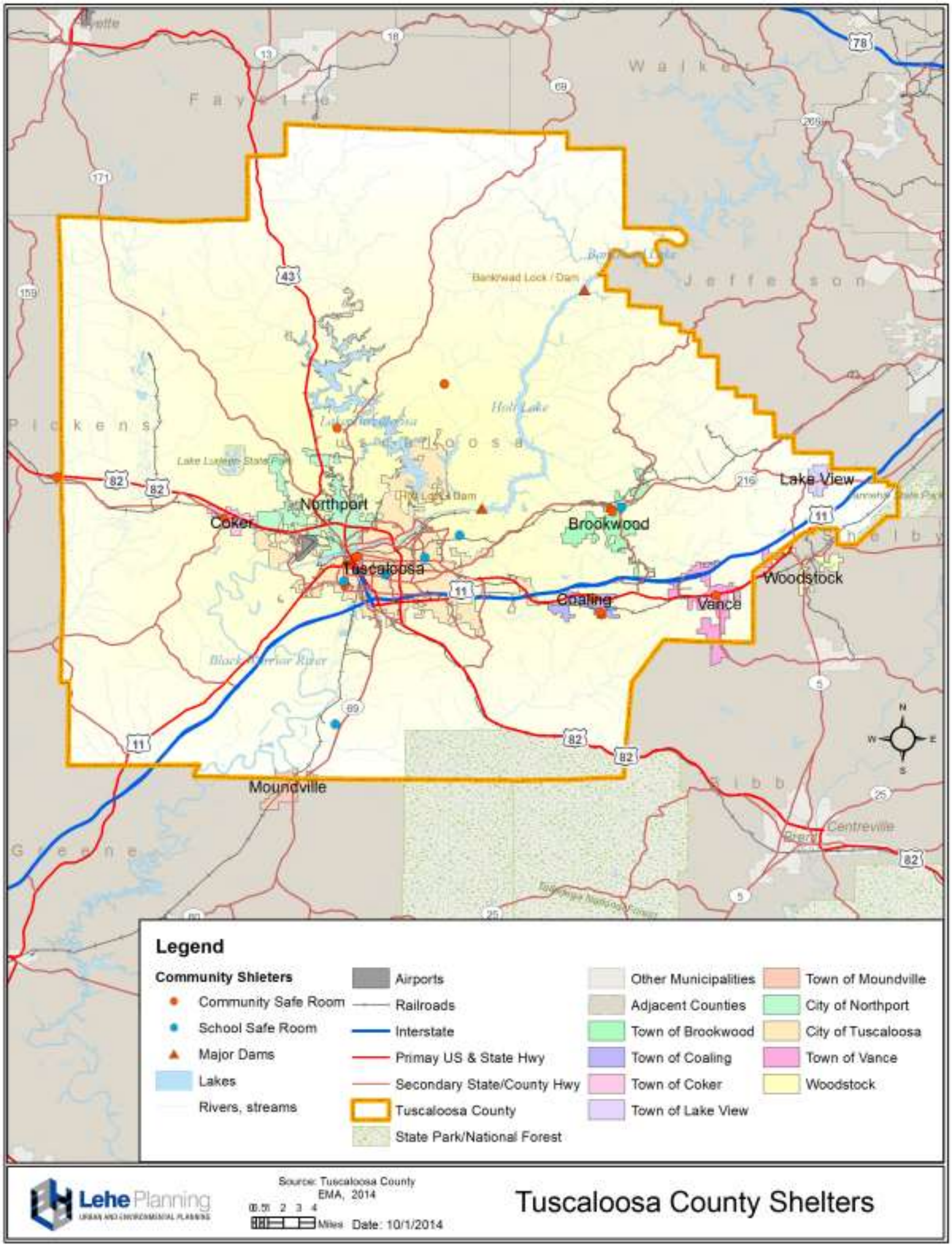


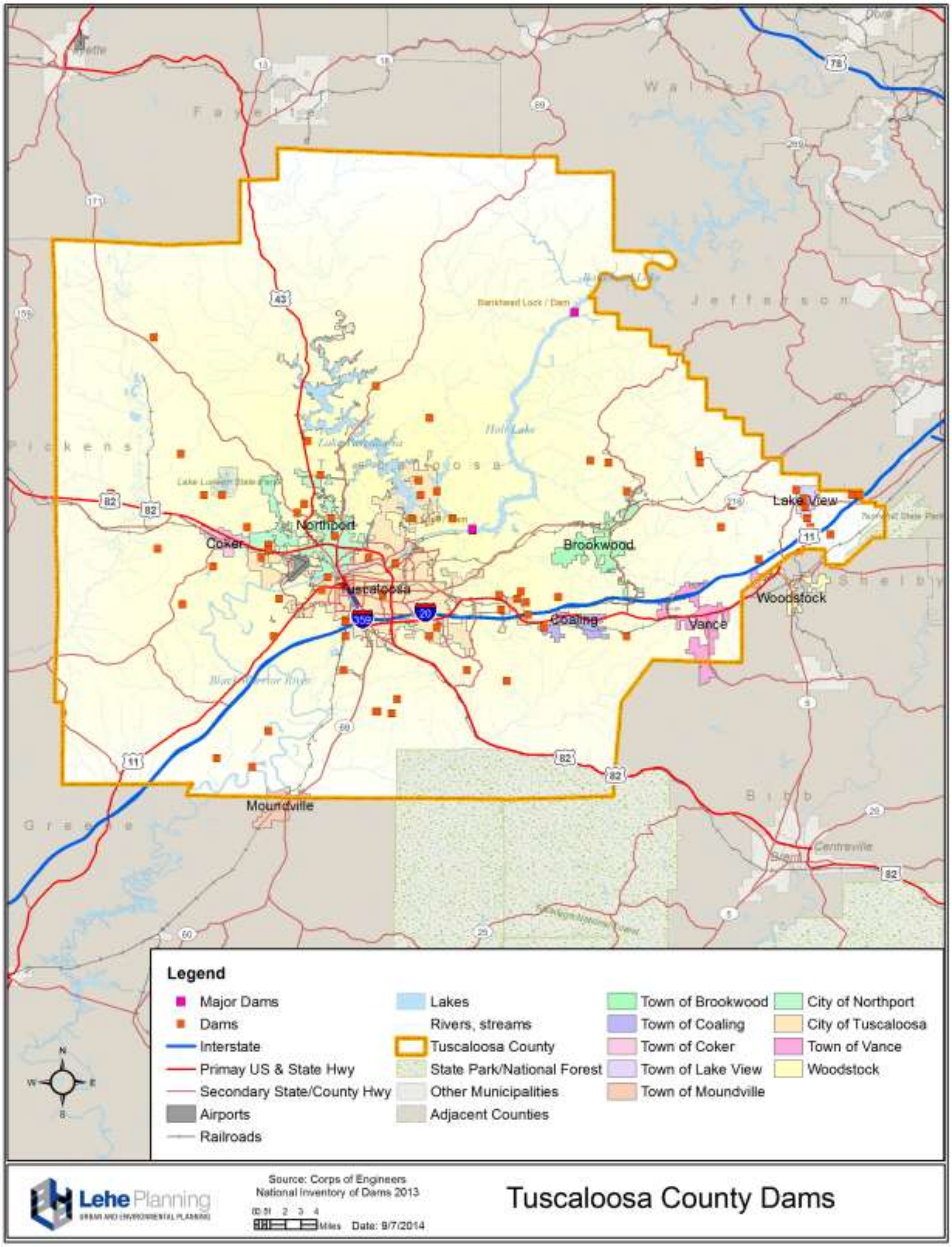
Table 5-41. Tuscaloosa County Dams

Dam Name	NID ID	Height (Ft.)	River	Max Discharge	Max Storage
AL No Name No. 1	AL01116	36	TR-Rockcastle Creek	203	209
Big Cypress Lake Dam	AL01136	11	TR-Black Warrior River	258	280
Bob Spiller	AL02267	23	Cypress Creek	100	80
Bryce Hospital Dam	AL01109	16	TR-Tater Hill Creek	2,276	91
Butch Wilson	AL02317	26	-	200	38
Cain Lake Dam Number 3	AL01437	29	TR-Wright Branch	513	62
Camp Horne Lake	AL01153	22	TR- Bee Branch	246	64
Camp Horne Lake Dam No. 1	AL01724	25	TR- Bee Branch	649	21
Canyon Lake Dam	AL01133	30	Bee Branch	4,465	155
Canyon Lake Dam Upper 3	AL01438	28	Bee Branch	700	82
Canyon Lake No 2	AL01155	32	TR-Bee Branch	340	116
Carolwood Lake Dam	AL01457	20	TR-Carroll Creek	586	86
Cunningham No. 1	AL01456	26	TR-Little Yellow Creek	700	95
Dream Lake Dam Number One	AL01123	29	Rockcastle Creek	700	372
Dream Lake Dam Number Three	AL01122	26	Rockcastle Creek	4,300	1,400
East Lake Dam	AL01453	30	TR-Cypress Creek	385	61
Echo Lake Dam	AL01132	26	Hurricane Creek	1,533	116
Elledge Lake Dam	AL01146	20	TR-Big Creek	1,367	150
Forest Lake Dam	AL01142	17	TR-Cribbs Mill Creek	22	90
Fresh Water Impoundment No. 1	AL83464	40	-	1,000	360
Fresh Water Impoundment No. 1	AL83467	40	-	700	45
Fresh Water Impoundment No. 2	AL83468	50	-	3,500	200
Gilbert Tommie Lake Dam	AL01126	18	TR-Cooley Creek	751	83
Gilbert Tommie No. 2	AL01460	32	TR-Cooley Creek	489	158
Harless Lake Dam	AL01455	28	TR-Box Creek	268	78
Herring Lake Dam	AL01121	17	Rockcastle Creek	550	50

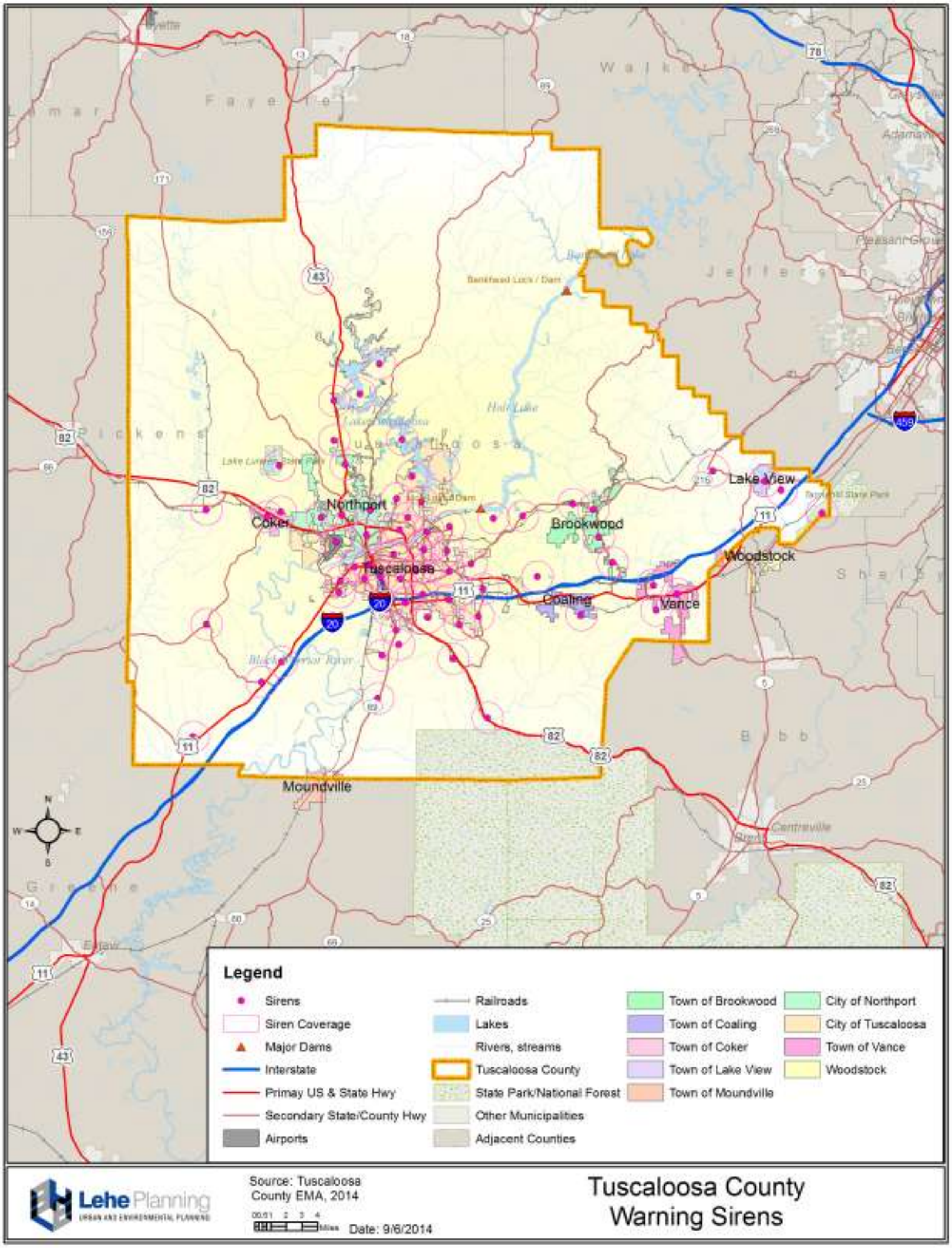
Dam Name	NID ID	Height (Ft.)	River	Max Discharge	Max Storage
Holt Lock Dam & Powerhouse	AL01426	120	Black Warrior River	639,500	117,990
Indian Hills Lake	AL01154	26	TR-Black Warrior River	540	62
Jack Duke Lake Dam	AL01113	17	TR-Wright Branch	758	153
Jaycee Partlow Dam Number One	AL01147	12	TR-Tater Hill Creek	887	94
Jaycee Partlow Dam Number Two	AL01148	11	TR-Tater Hill Creek	481	79
JB Acker	AL02268	24	Sipsey River	170	95
John Hollis Bankhead Lock Dam & PH	AL01427	111	Black Warrior River	666,000	296,000
Lake Anedna	AL01140	15	TR-Big Creek	486	126
Lake Duke Dam Lower	AL01446	26	Wright Branch	50	141
Lake Gloria Dam	AL01143	12	Grant Creek	535	84
Lake Grace Dam	AL01130	25	TR -Bee Branch	422	99
Lake Harris Dam	AL01150	58	Yellow Creek	3,511	3,526
Lake Judson Dam	AL01128	21	Bunch Creek	1,950	108
Lake Lurleen Dam	AL01108	41	TR-Big Creek	3,730	3,164
Lake Nicol Dam	AL01111	82	Yellow Creek	1,924	10,349
Lake No. 7 Dam	AL01445	29	TR-Rockcastle Creek	300	83
Lake Retreat Dam	AL01444	28	TR-Davis Creek	305	120
Lake Sherwood Dam	AL01145	20	TR-Mill Creek	1,800	78
Lake Tina Dam	AL01452	19	TR-Black Warrior River	203	92
Lake Tuscaloosa Dam	AL01137	125	North River	50,000	180,000
Lake Tuscoba Dam	AL01442	20	TR-Two Mile Creek	6,125	256
Lake Wildwood Dam	AL01135	32	TR-Kepple Creek	2,118	295
Lary Lake Dam	AL01124	34	TR-Lary Creek	1,030	357
Little Reservoir Dam	AL01441	40	TR-Black Warrior River	95	106
Mallard Lake Dam	AL01131	26	Bee Branch	641	159
McPherson Dam	AL01443	30	TR-Black Warrior River	403	73
Mildred Warner Dam	AL01110	30	TR-Jay Creek	550	543
Mills Lake Dam Lower	AL01447	16	TR-Mill Creek	330	86

Dam Name	NID ID	Height (Ft.)	River	Max Discharge	Max Storage
Mimosa Park Dam	AL01134	17	TR- Cypress Creek	27	568
Mud Lake Dam	AL01118	24	Gallant Branch	960	103
Northwood Lake Dam	AL01138	21	TR-Two Mile Creek	231	560
Old Railroad Grade Pond	AL01157	26	TR-Little Sandy Creek	3	83
Paradise Lake Dam	AL01112	16	TR-Gallant Branch	1,860	153
Patton Lake	AL01152	19	TR-Cribbs Mill Creek	580	60
Pine Lake Dam	AL01149	25	TR-Thornton Creek	207	273
Russell Lee Lake Dam	AL01451	11	TR-Black Warrior River	292	78
Sewage Lagoon Dam North	AL01439	16	TR-Cribbs Mill Creek	122	76
Sewage Lagoon Dam South	AL01440	16	TR-Cribbs Mill Creek	122	104
Skelton No. 1	AL01450	20	TR-Black Warrior River	250	106
Slurry Impoundment No. 1	AL83465	40	-	200	500
Slurry Impoundment No. 1	AL83466	80	-	2,000	960
Snag Lake Dam	AL01139	12	TR- Black Warrior River	132	234
Springhill Lake Dam	AL01151	27	Cypress Creek	2,778	153
Steiner Lake Dam	AL01127	23	TR-Horse Creek	2,462	112
Swanson Lake Dam	AL01144	13	TR-Mill Creek	298	99
Vining Pond Dam	AL01448	31	TR-Hurricane Creek	64	146
Wagon Wheel Lake Dam	AL01454	26	TR-Tierce Creek	1,182	80
William Bacon Oliver Replacement	AL01981	67	Black Warrior River	52,000	13,800
Williams Lake	AL02450	33	Black Warrior River	80	77
Yacht Club Bay Dam No. 15	AL01458	45	TR-North River	120	72
Yacht Club Bay Dam No. 8	AL01459	41	TR-North River	485	28

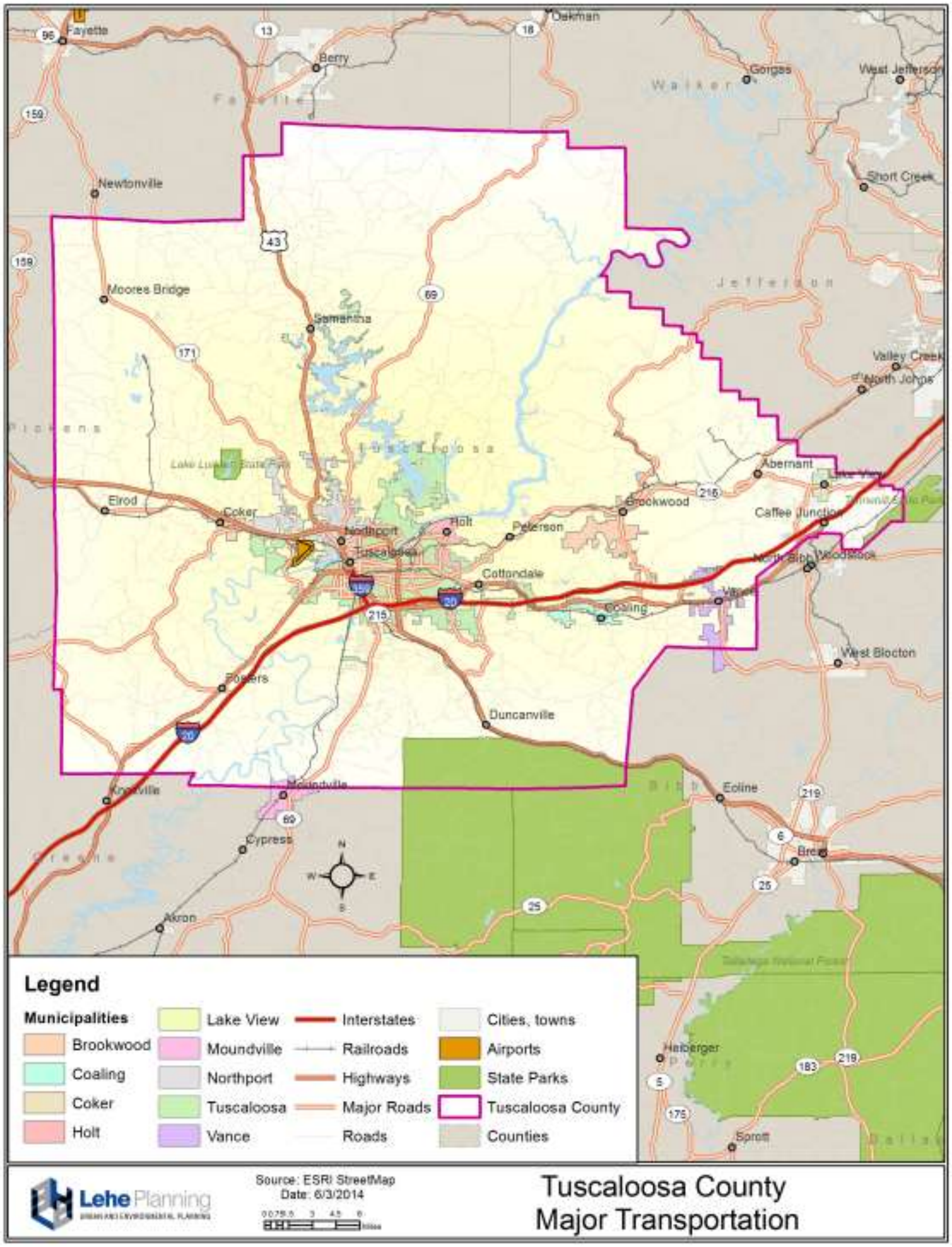
Map 5-32. Tuscaloosa County Dams



Map 5-33. Tuscaloosa County Warning Sirens



Map 5-34. Tuscaloosa County Transportation Infrastructure



5.6 Estimate of Dollar Losses to Vulnerable Structures

5.6.1 Scope and Purpose of Loss Estimates

This section provides estimates of damages to vulnerable structures identified above in Section 5.5. Lost estimates are calculated using the structure, contents, and function of each asset. The following definitions are used:

- ✓ *Structure loss* – (% damage) X ($ replacement value of the structure)
- ✓ *Content loss* – (% damage) X ($ replacement value of the contents)
- ✓ *Functional Loss* - indirect effects of the hazard, such as the days of interruptions in operations that an asset incurs during an event.

For hazards with damage records, loss estimates count damages from the most probable severity. For location-specific events, loss estimates evaluate the affected parts of each jurisdiction. Although these estimates are broad, they can be useful in roughly assessing the benefits and costs of a proposed mitigation project. Moreover, these estimates provide a basis for selecting and prioritizing actions recommended by the Mitigation Strategy in Chapter 6.

This section also describes methodology and highlights limitations of insufficient data and lack of reliable methods. Measures for compiling and analyzing data to improve risk assessment studies appear in Section 5.6.5 "Recommended Risk Assessment Measures."

As explained above, most hazards are county-wide. In the case of county-wide hazards, exposure is distributed uniformly over all municipalities and unincorporated areas. County-wide hazards include tornadoes, severe storms, winter storms/freezes, droughts/heat waves, wildfires, and earthquakes. In contrast, exposure to location-specific hazards—including flooding, dam/levee failures, sinkholes and landslides—varies widely among jurisdictions.

5.6.2 Loss Estimate Methodology

Method 1: HAZUS-MH Loss Estimates

This plan estimates losses using HAZUS-MH, which was used as a basis for the vulnerable structures inventory of Section 5.5. 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. These 2011 HAZUS-MH loss estimates are updates of estimates included in the 2006 plan.

HAZUS-MH offers three levels of analysis. Level 1 requires the least amount of local data and is sufficient for mitigation policy planning purposes. A Level 1 analysis relies on the national data set provided with HAZUS-MH. The analysis provides general loss estimates for earthquakes, floods, and hurricane winds. All loss estimates are at a county level, which is the smallest geographic area of meaningful analysis using HAZUS-MH.

Method 2: Estimates Based upon Historical Records

Data and records from Section 5.4 supplemented the HAZUS-MH data to prepare loss estimates. Damage data and records of previous occurrences were obtained from the following primary sources:

1. NFIP insurance claims data since 1978 (see Section 5.8);
2. NOAA, National Climatic Data Center damage estimates (see damage summaries in Section 5.4 "Hazard Profiles" and Appendix E "Hazard Profile Data."
3. National Weather Service Alabama Tornado database.
4. Alabama State Hazard Mitigation Plan, 2013 update, section 5.4 "Vulnerability Assessment and Loss Estimation."

Jurisdictional Estimates

To derive jurisdictional estimates, the planning team used existing (2012) and future (2030) population estimates to distribute losses among Tuscaloosa County's ten jurisdictions. Population distribution appears in Table 5-42 below. (See Section 5.5.2 "Inventory Methodology"). The damage estimates in this section, however, only apply to existing conditions.

Table 5-42. Population Distribution by Jurisdiction, 2012 & 2030

Jurisdiction	Estimated 2012	% of 2012	Projected 2030	% of 2030 Projection
Brookwood	1,834	0.9%	4,243	1.83%
Coaling	1,665	0.8%	2,204	0.95%
Coker	982	0.5%	1,003	0.43%
Lake View	2,041	1.0%	3,623	1.56%
Moundville	2,439	1.2%	2,551	1.10%
Northport	24,120	12.1%	31,645	13.65%
Tuscaloosa	93,683	47.1%	109,101	47.06%
Vance	1,535	0.8%	6,822	2.94%
Woodstock	1,443	0.7%	1,584	0.68%
Unincorporated	68,952	34.7%	69,069	29.79%
Tuscaloosa County	198,694	99.8%	231,846	100.00%

5.6.3 HAZUS-MH Loss Estimates

The planning team performed HAZUS-MH Hurricane studies to estimate losses. Global Summary and Quick Assessment Reports of the HAZUS-MH runs contain detailed results. These studies, maps, and reports were prepared by a qualified GIS professional with advanced HAZUS training classes completed at the FEMA Emergency Management Institute in Emmitsburg, Maryland, and extensive experience in its local application to mitigation planning. The following HAZUS-MH reports are on file with the Tuscaloosa County EMA and available for public review:

- HAZUS-MH 100 Year Flood Event Global Report, dated August 21, 2014
- HAZUS-MH 100 Year Flood Event Quick Assessment Report, dated August 21, 2014
- HAZUS-MH Hurricane Frederic Event Global Report, dated September 18, 2014
- HAZUS-MH Hurricane Frederic Quick Assessment Report, dated September 18, 2014
- HAZUS-MH Historic Irondale Earthquake Event Global Report, dated June 18, 2014
- HAZUS-MH Historic Irondale Earthquake Event Quick Assessment Report, dated June 18, 2014

Flood Loss Estimates

The planning team used HAZUS-MH to assess the 100-year flood event scenario. The following table itemizes the overall "Quick Assessment" results for the 100-year flood event.

Table 5-43. HAZUS-MH Flood Module Quick Assessment Results

Tuscaloosa County 100 Year Flood Event	
Area (Square Miles)	1,324
Number of Residential Buildings	62,387
Number of All Buildings	68,164
Number of Persons in the Region	165,000
Residential Building Exposure ($ millions)	$8,198
Total Building Exposure ($ millions)	$11,355
Residential Property (Capital Stock) Losses ($ millions)	$303
Total Property (Capital Stock) Losses ($ millions)	$605
Business Interruptions (Income) Losses ($ millions)	$2
Total Economic Losses ($ millions)	**$910**

Economic Losses by Jurisdiction. The following table shows jurisdictional loss estimates, which were obtained by dividing the county's total losses by each jurisdiction's share of the 2012 county population.

Table 5-44. Total Economic Losses by Jurisdiction

Jurisdiction	Share of Losses	Total Economic Losses ($ millions)
Brookwood	0.9%	$8.19
Coaling	0.8%	$7.28
Coker	0.5%	$4.55
Lake View	1.0%	$9.1
Moundville	1.2%	$10.92
Northport	12.1%	$110.11
Tuscaloosa	47.1%	$428.61
Vance	0.8%	$7.28
Woodstock	0.7%	$6.37
Unincorporated	34.7%	$315.77
Tuscaloosa County	99.8%	$908.18

*Total % does not equal 100, due to rounding

Building-Related Damages. HAZUS estimates that a 100-year flood event would moderately damage approximately 2,119 buildings – over 17 percent of the total number of buildings at risk of flooding in Tuscaloosa County. The event would destroy 495 buildings. The following tables show the detailed results, and GIS maps illustrate the HAZUS-generated damages due to flooding.

Table 5-45. Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	1	9.09	4	36.36	2	18.18	4	36.36	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	13	76.47	2	11.76	0	0.00	1	5.88	1	5.88
Religion	0	0.00	4	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	29	1.39	462	22.13	302	14.46	801	38.36	494	23.66
Total	1		50		466		306		802		495	

Table 5-46. Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0.00	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	311	100.00
Masonry	0	0.00	5	11.11	4	8.89	3	6.67	31	68.89	2	4.44
Steel	1	5.88	9	52.94	3	17.65	2	11.76	1	5.88	1	5.88
Wood	0	0.00	31	1.78	458	26.32	299	17.18	771	44.31	181	10.40

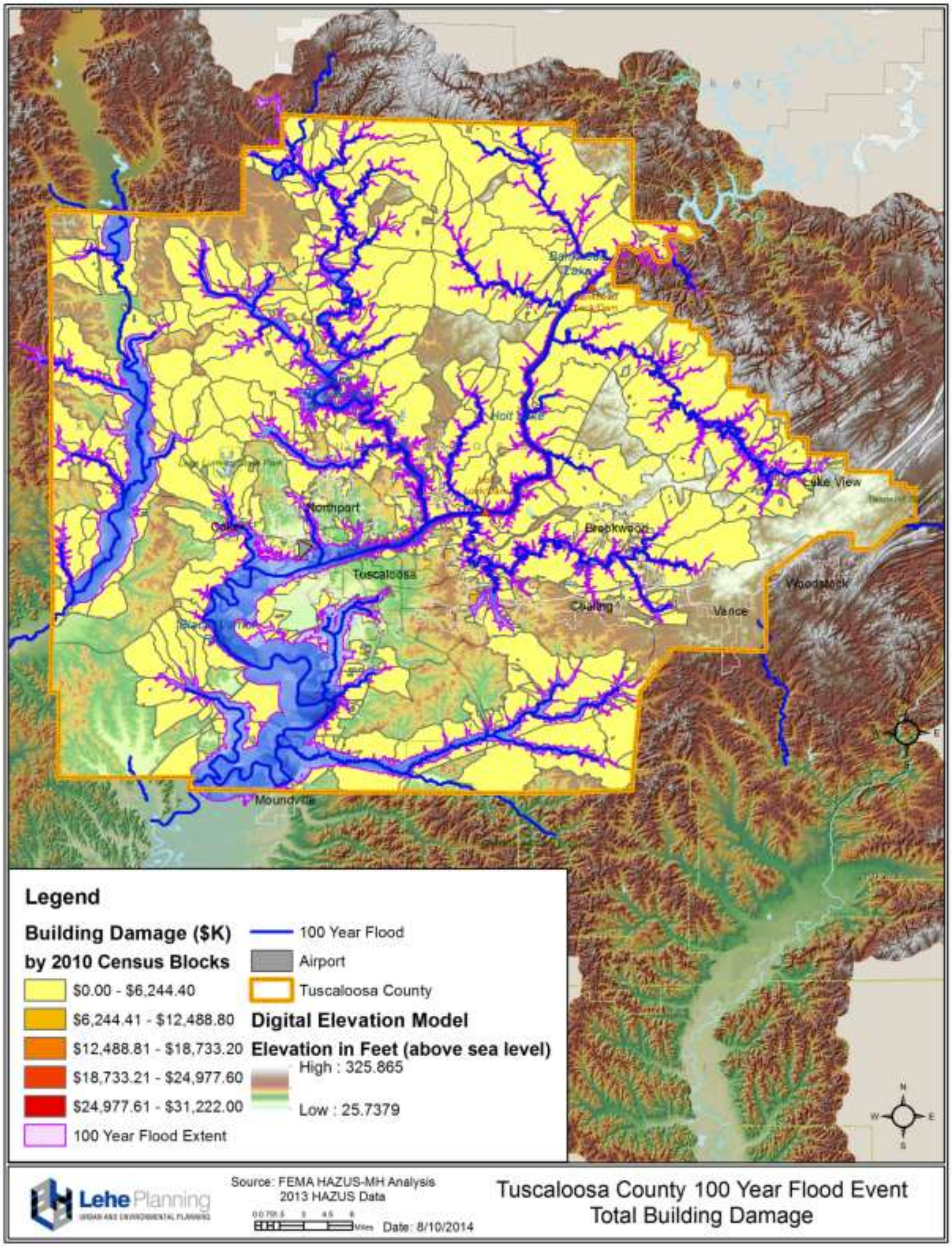
Essential Facilities Damages. HAZUS predicts that a 100-year flood event would cause no damage to the estimated 91 essential facilities (police stations, fire stations, hospitals, and schools) in Tuscaloosa County.

Building Related Losses. Building losses are broken into two categories by HAZUS: direct building losses and business interruption losses. Direct building losses include estimated costs to repair or replace damaged buildings and contents. Business interruption losses are losses associated with the inability to operate a business as a result of the flood and also include temporary living expenses for displaced households. The total losses are estimated at $607.06 million. Residential occupancies account for 50.03% of the total loss.

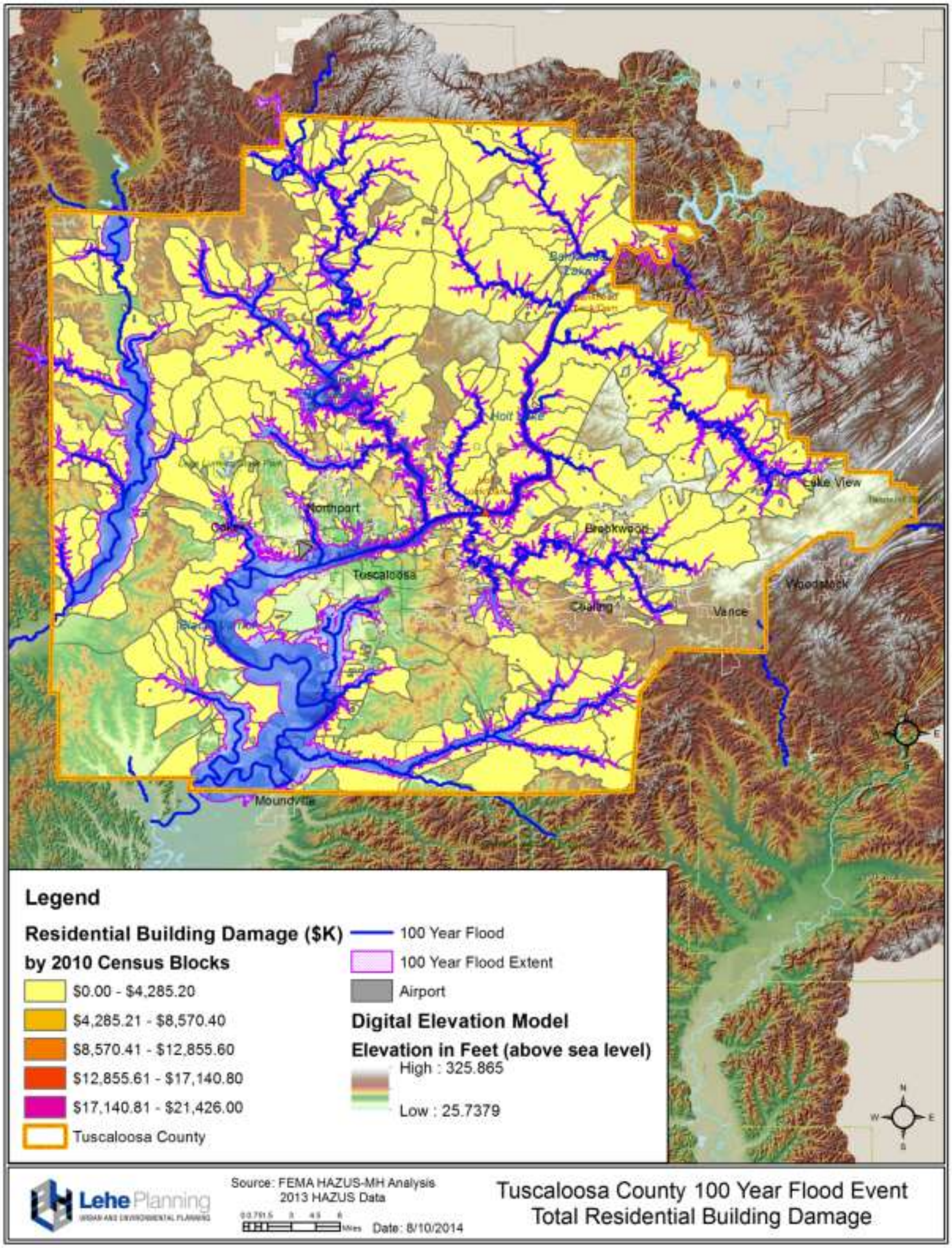
Table 5-47. Building Related Economic Loss Estimates ($ millions)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	190.70	46.36	22.27	10.77	270.11
	Content	112.67	102.36	57.63	45.50	318.16
	Inventory	0.00	2.80	13.11	0.51	16.42
	Subtotal	303.38	151.52	93.00	56.78	604.68
Business Interruption						
	Income	0.00	0.61	0.01	0.13	0.75
	Relocation	0.26	0.11	0.01	0.06	0.44
	Rental Income	0.05	0.08	0.00	0.00	0.14
	Wage	0.01	0.57	0.01	0.45	1.05
	Subtotal	0.33	1.37	0.04	0.64	2.38
ALL	Total	303.70	152.89	93.04	57.42	607.06

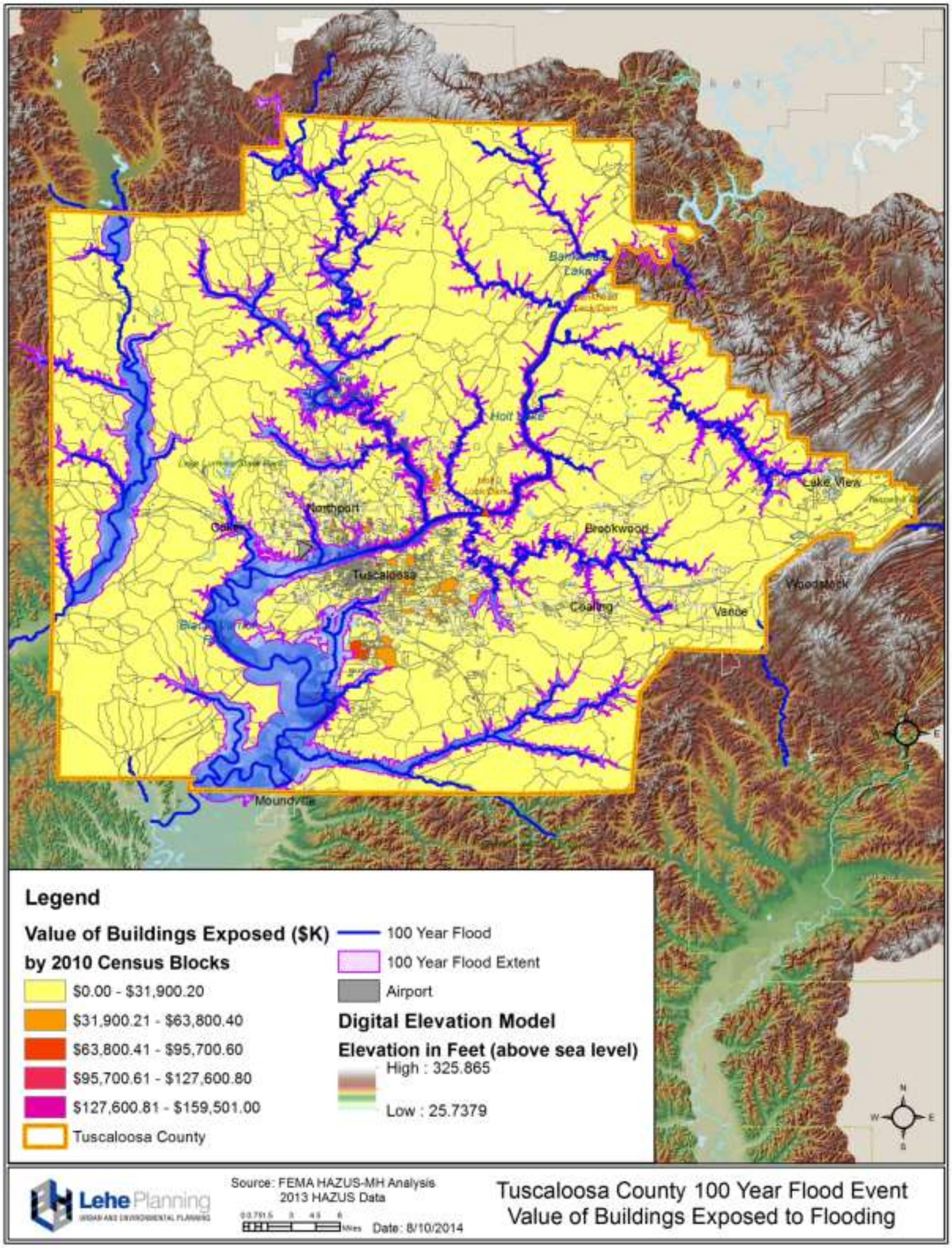
Map 5-35. Total Building Damage from 100 Year Flood



Map 5-36. Total Residential Building Damage from100 Year Flood



Map 5-37. Value of Buildings Exposed to 100 Year Flood



Hurricane Loss Estimates

The planning team used HAZUS-MH to assess a historic Hurricane Frederic event scenario. HAZUS only assesses the hurricane wind effects of each event. The following tables show the direct economic losses generated by HAZUS-MH, followed by Map 5-38, which shows the geographic distribution of economic losses as a result of Hurricane Frederic.

Table 5-48. HAZUS-MH Hurricane Scenarios

General Building Stock

Occupancy	*Building Count*	*Dollar Exposure ($ M)*
Residential	62,387	8,198
Commercial	3,716	2,014
Other	2,061	1,144
Total	68,164	11,355

Number of Buildings Damaged

Damage State	*Residential*	*Commercial*	*Other*	*Total*
Minor	800	50	20	800
Moderate	40	<10	0	50
Severe	0	0	0	0
Destruction	0	0	0	0
Total	800	50	20	900

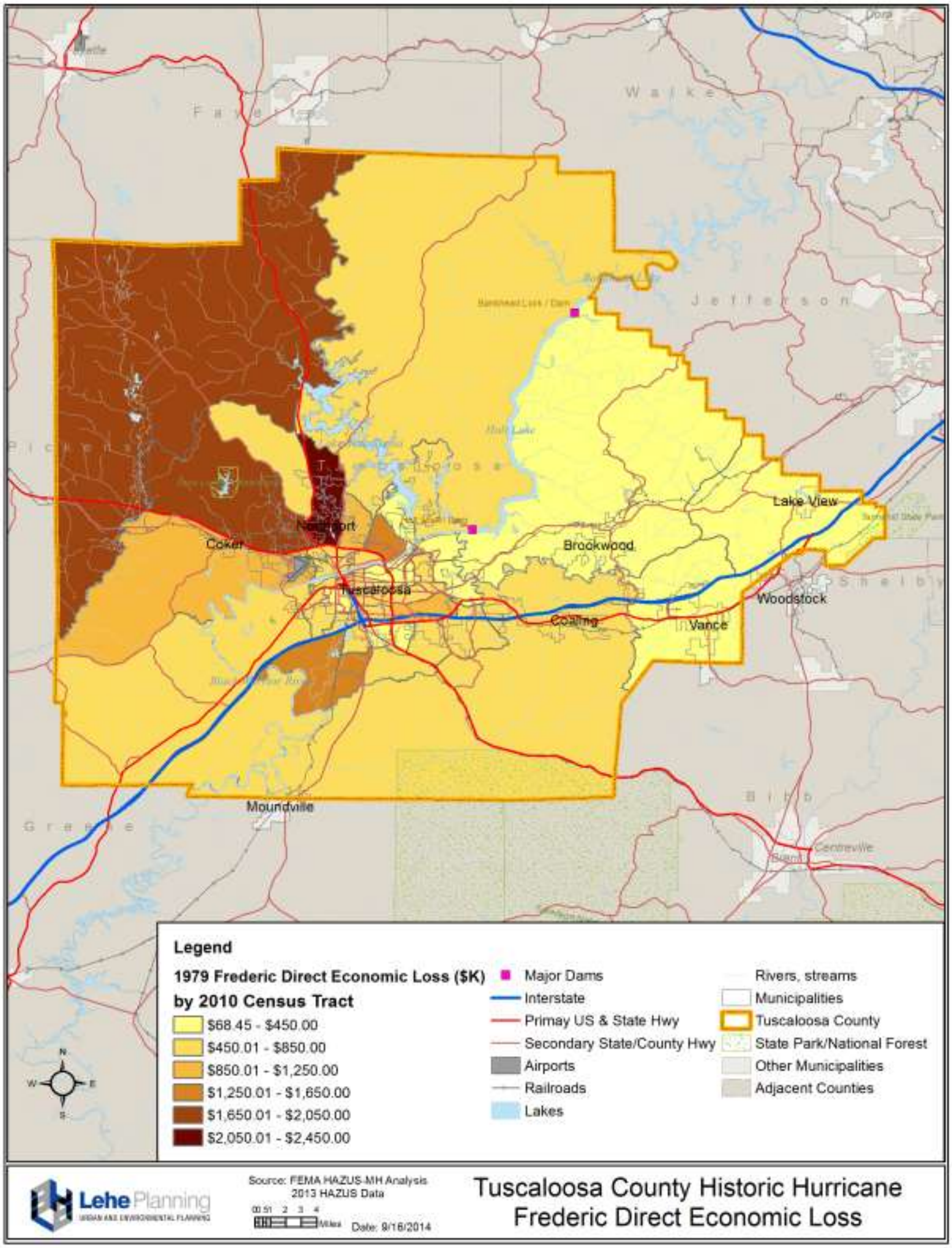
Shelter Requirements

Displaced Households (# Households)		0
Short Term Shelter (# People)		0

Economic Loss ($ Millions)

Capital Stock		30
Residential Property	29	
Commercial Property	<1	
Other Property	<1	
Business Interruption (Income)		1
Total Direct Economic Loss		31

Map 5-38. HAZUS-MH Historic Hurricane Frederic Direct Economic Loss



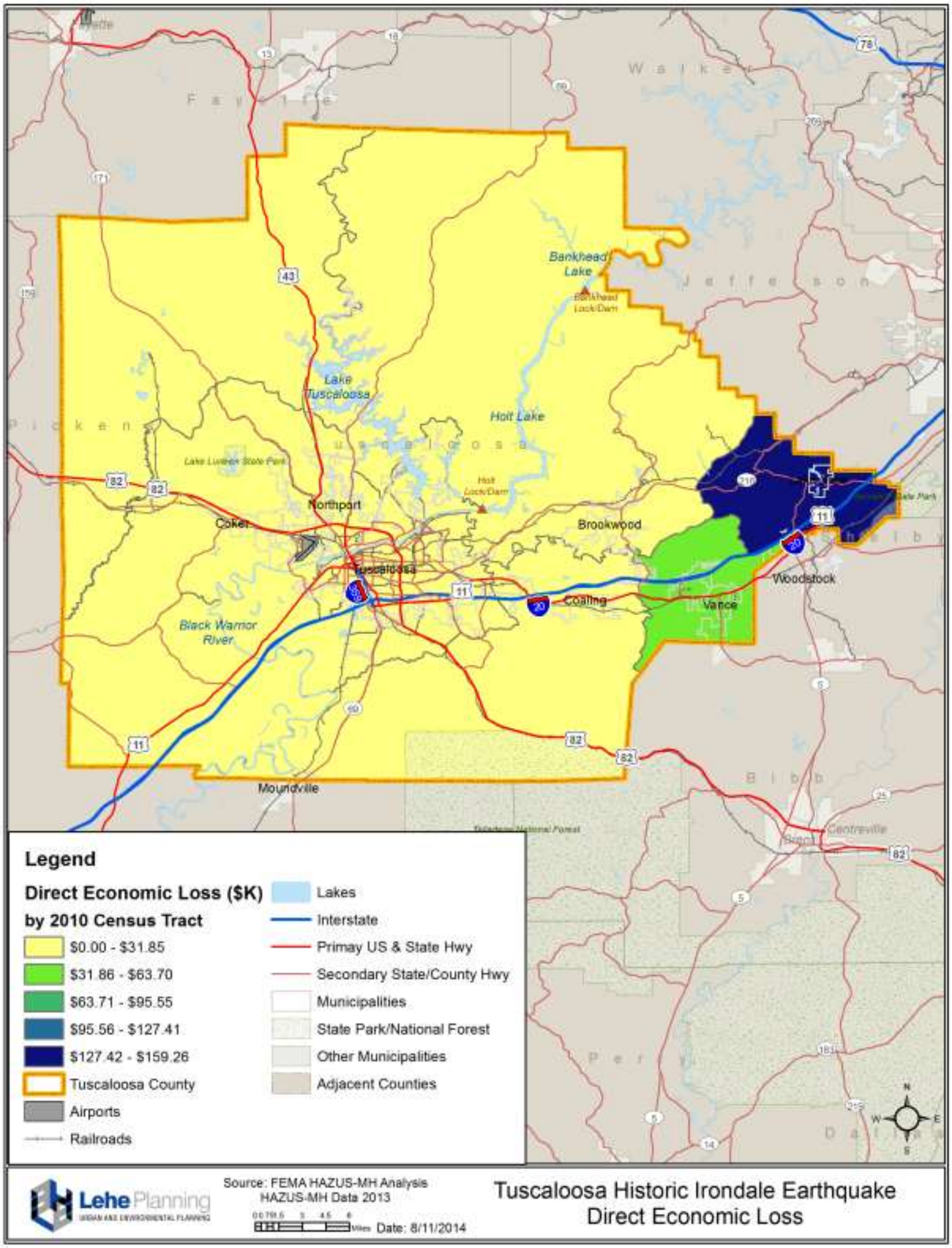
Earthquake Loss Estimates

The planning team used HAZUS-MH to estimate the losses as a result of the historic Irondale earthquake event. Results indicate that approximately 11 buildings will sustain at least moderate damage, less than 1% of all buildings. No buildings will sustain damage beyond repair. HAZUS-MH predicts no damage to essential facilities—such as hospitals, schools, EOCs, Police and Fire Stations—although 4 percent of hospital beds would be unavailable immediately after the event, with all but 1 percent in service one week later and 100 percent of beds operational after 30 days.

Additionally, the event report predicts that all components of the transportation system will maintain at least 50 percent functionality, because no component will suffer damage. Likewise, HAZUS predicts no disabling damage to the utility infrastructure but rather only a handful of leaks and breaks in water and gas lines. Therefore, the model projects no interruption of water, gas, or electrical service.

No casualties are expected, and total building-related economic losses (structural, contents, inventory, income and wages, etc.) are estimated at $220,000 countywide, 32% of which can be attributed to business interruption losses. The largest loss is expected to be sustained by the residential occupancies which make up over 53% of the total loss. Estimated damage to transportation, utilities and communications systems is minimal. Map 5-39 shows the direct economic impact by 2010 Census tracts.

Map 5-39. Historic Irondale Earthquake Economic Loss Impacts



5.6.4 Loss Estimates Based on Historical Records

Tornado Loss Estimates

According to the NOAA National Climatic Data Center (NCDC) records (see Section 5.4.1 “Tornadoes Profile”), Tuscaloosa County has been the site of 44 tornadoes since 1996, averaging 3.4 annually. These tornadoes caused 56 deaths, 964 injuries, and property damages of over $1.5 billion.

Severe Storms Loss Estimates

As reported in the severe storms hazard profile in Section 5.4.2, National Climatic Data Center records show frequent annual severe storm occurrences since 1996. The database shows 216 severe storm events for Tuscaloosa County—roughly 12 per year. The database also shows approximately $5.5 million in damages since 1996.

Flood Loss Estimates

The National Climatic Data Center Storm Events Database shows approximately 2.7 floods per year, on average since 1996 (Section 5.4.3). There have been 43 floods reported for Tuscaloosa County for the 1996 to 2013 period. Average annual damages are estimated at $32,875.

Droughts/Heat Waves Estimates

The National Climatic Data Center estimated 23 droughts and 20 extreme heat events for the period 1996 to 2013. One death and 50 injuries occurred as a result and $125,000 in total damages was incurred.

Winter Storms/Extreme Cold Estimates

The National Climatic Data Center estimated that 5 winter storms and two extreme cold events occurred in the period 1996 to 2013. Damages amounted to $71,000.

Loss Estimates for Remaining Hazards

Historical data is not sufficient to estimate losses for the remaining hazards identified in this Plan. In some cases there have been no recorded events and/or data was not adequately collected. In other cases, damages were not measurable.

5.6.5 Recommended Risk Assessment Measures

The Mitigation Strategy of this Plan (Chapter 6) 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.

5.7 General Description of Land Uses and Development Trends

5.7.1 Impacts of Development Trends on Vulnerability

Development trends demand consideration in any plan for hazard mitigation. This section examines development trends affecting vulnerability to natural hazards. Development can raise vulnerability in several ways, including:

- Competing uses for land can push new development into areas prone to flooding, landslides and other location-specific hazards.
- New roads, parking lots, and other impervious surfaces can increase urban runoff and thereby exacerbate flooding.
- New residential, commercial and industrial development in previously rural areas can boost the community's vulnerability to wildfires.
- Increased population can stretch scarce water resources in times of drought.
- Development on slopes and geologically unstable terrain can increase exposure to and even cause sinkholes and landslides.

5.7.2 Past Trends

Growth in Tuscaloosa County outpaced that of the State's growth from 2000 to 2010, by almost 11%. Growth rates from 1990 to 2000 were closer, at 10.1% for the State and 9.5% for the County. Table 5-49 depicts population growth trends from 1990 to 2010.

Table 5-49. Tuscaloosa County Historic Growth Trends

Jurisdiction	1990	2000	Number Change (1990-2000)	Percent Change (1990-2000)	2010	Number Change (2000-2010)	Percent Change (2000–2010)
Alabama	4,040,389	4,447,100	406,711	10.1%	4,779,736	332,636	7.5%
Tuscaloosa County	150,522	164,875	14,353	9.5%	194,656	29,781	18.1%
Brookwood	658	1,483	825	125.4%	1,828	345	23.3%
Coaling	1,181	1,115	-66	-5.6%	1,657	542	48.6%
Coker	956	808	-148	-15.5%	979	171	21.2%
Lake View	1,012	1,357	345	34.1%	1,943	586	43.2%
Moundville	--	1,809	--	--	2,427	618	34.2%
Northport	17,297	19,435	2,138	12.4%	23,330	3,895	20.0%
Tuscaloosa	77,759	77,906	147	0.2%	90,468	12,562	16.1%
Vance	248	500	252	101.6%	1,529	1,029	205.8%
Woodstock	--	--	--	--	1,428	--	--

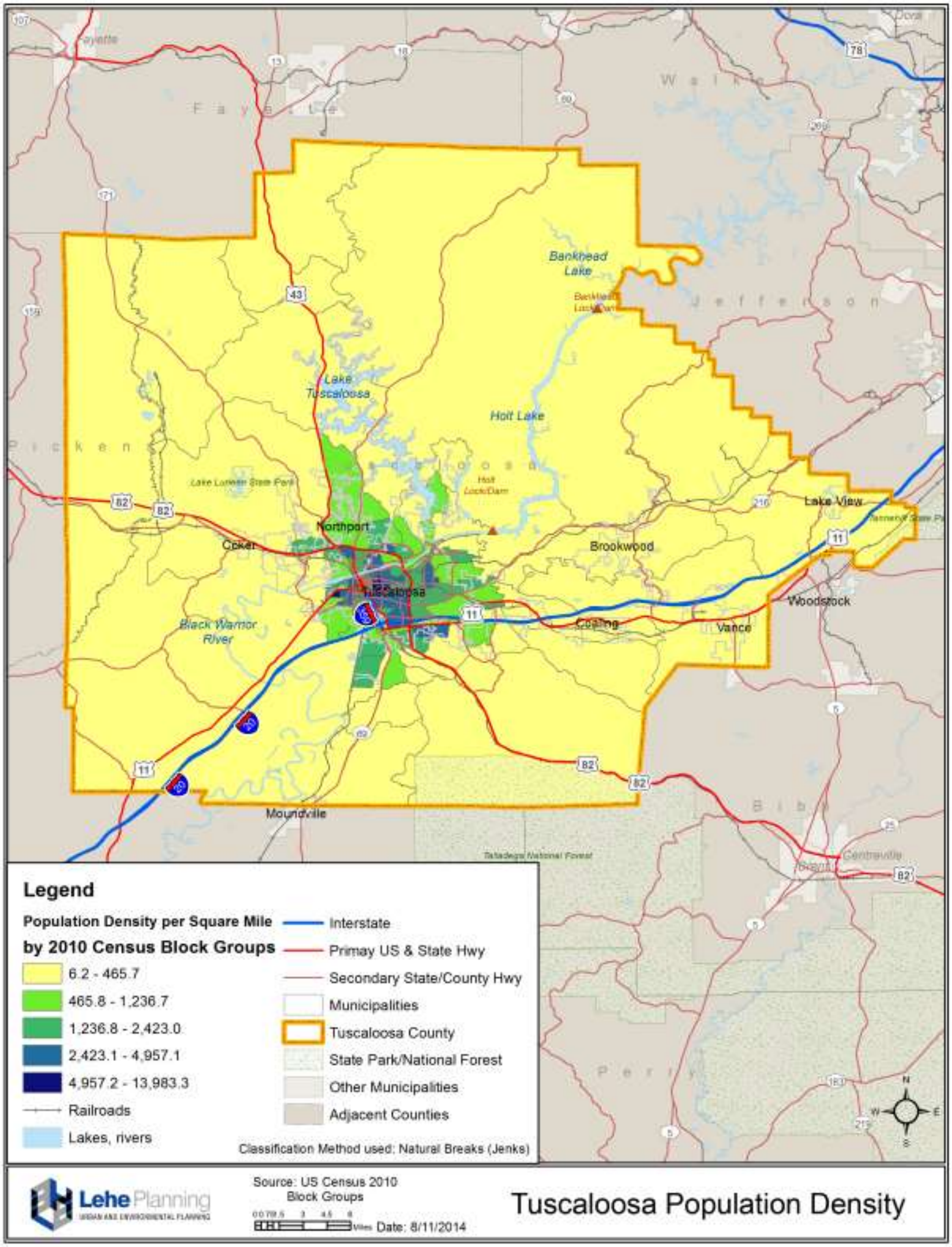
Source: U.S. Census Bureau, 2010

Distribution of Growth within Tuscaloosa County

With a 2010 population of 90,468 the City of Tuscaloosa is the largest city in Tuscaloosa County, followed by 23,330 people residing in Northport. Figures for the unincorporated portions of the county cannot be calculated as U.S. Census data was unavailable for Moundville and Woodstock. From 1990 to 2000, the Towns of Coaling and Coker saw a decrease in population. However, from 2000 to 2010, all of the county's jurisdictions increased in population. Much of that growth occurred in the Towns of Vance, Coaling, Lake View, and Moundville, though these towns do not account for a large portion of the overall population of Tuscaloosa County. The largest cities in the county, Tuscaloosa and Northport, saw growth at a rate of 16% and 20%, respectively.

Map 5-40 shows population density (persons per square mile) for Tuscaloosa County in 2010. The densest areas are predominately located in and around the City of Tuscaloosa.

Map 5-40. Population Density in Tuscaloosa County

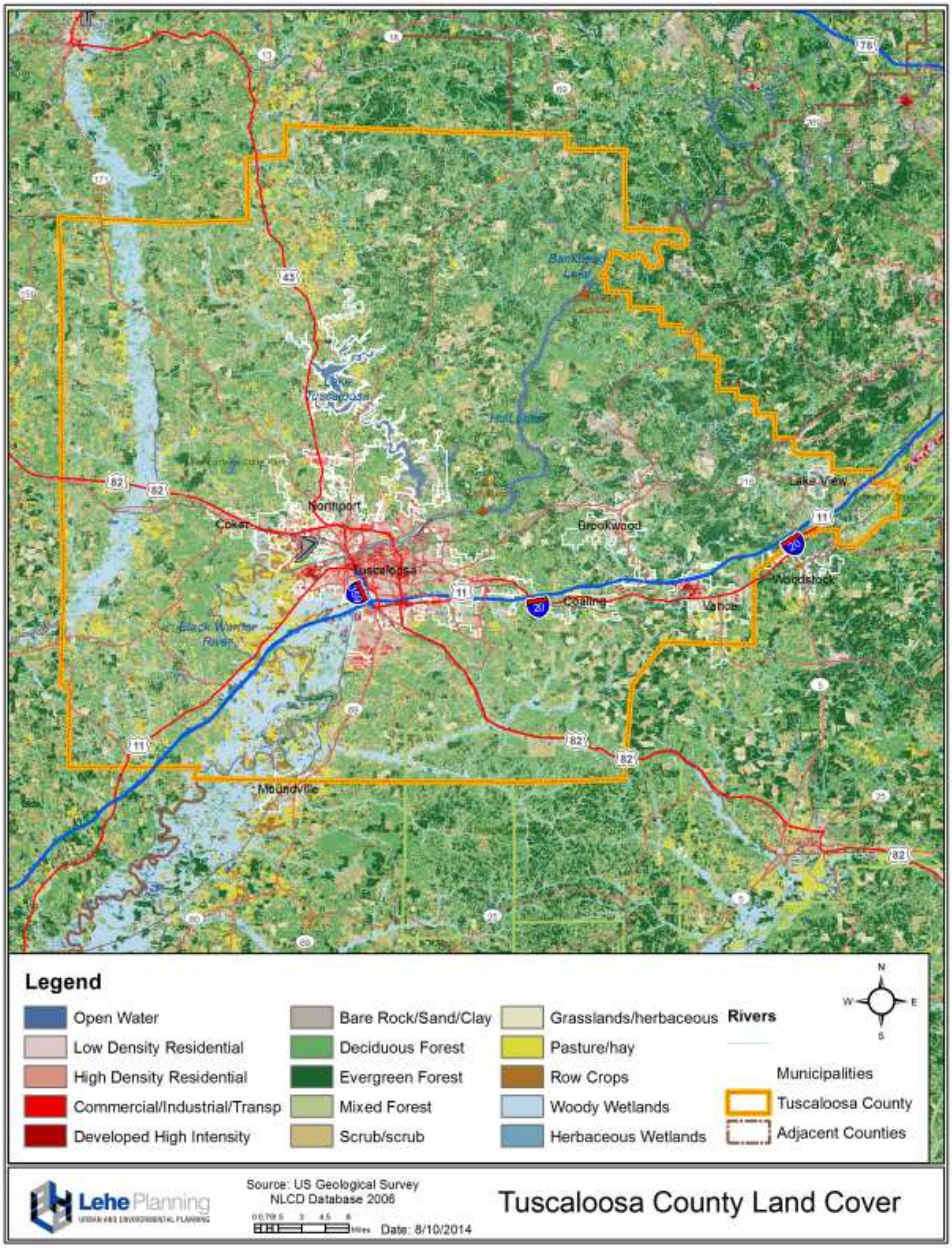


Land Use

Tuscaloosa County has an area of approximately 1,351 square miles, of which 1,322 square miles is land and 30 square miles is water (U.S. Census Bureau). The county is located in West Alabama, between the Appalachian Highlands and the Gulf Coastal Plain. The Talladega National Forest is located in the county and the Black Warrior River runs through the cities of Tuscaloosa and Northport. Bankhead Lock and Dam and Holt Lock and Dam are two of the major dams in Tuscaloosa County.

Map 5-41 “Land Cover” shows that the majority of Tuscaloosa County is characterized by deciduous and evergreen forest. Areas of residential and commercial development, in addition to transportation networks are seen in and around the cities of Tuscaloosa and Northport, as well as near the Town of Vance.

Map 5-41. Tuscaloosa County Land Cover



5.7.3 Future Trends

Table 5-50 presents projected growth in Tuscaloosa County and the State of Alabama, between 2000 and 2030 according to projections compiled by the Center for Business and Economic Research at the University of Alabama. Alabama's population growth between 2000 and 2030 nears 21%, compared to a growth twice that at 41% for the County. These projections are based on historical data and do not reflect current economic development efforts in Tuscaloosa County or throughout the State. Table 5-51 shows the estimated 2012 population and the projected 2030 population by jurisdiction. The City of Tuscaloosa accounts for most of the projected 2030 growth at 47%, followed by approximately 30% growth in the unincorporated portions of the county.

Table 5-50. Population 2000-2010 and Projections 2015-2035

Population Estimate/Projection						Change 2000-2030	
	2000[a]	2010[a]	2015[b]	2025[b]	2030[b]	Number	Percent
Alabama	4,447,100	4,779,736	4,943,866	5,242,423	5,365,245	918,145	20.6%
Tuscaloosa	164,875	194,656	204,654	223,476	231,846	66,971	40.6%

[a] US Census Bureau. 2010 Census [b] Center for Business and Economic Research, U. of Alabama

Table 5-51. Population Projections by Jurisdiction

Jurisdiction	Estimated 2012	Projected 2030	Projected Change 2012-2030	Percent Change 2012-2030	% of Total 2030
Brookwood	1,834	4,243	2,409	131.35%	1.8%
Coaling	1,665	2,204	539	32.37%	0.9%
Coker	982	1,003	21	2.18%	0.4%
Lake View	2,041	3,623	1,582	77.53%	1.6%
Moundville	2,439	2,551	112	4.60%	1.1%
Northport	24,120	31,645	7,525	31.20%	13.6%
Tuscaloosa	93,683	109,101	15,418	16.46%	47.1%
Vance	1,535	6,822	5,287	344.44%	2.9%
Woodstock	1,443	1,584	141	9.79%	0.7%
Unincorporated	68,952	69,069	117	0.17%	29.8%
Tuscaloosa Co.	198,694	231,846	33,152	16.68%	99.9%

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

*Tuscaloosa County Total does not equal 100% due to rounding

Economic development prospects

Tuscaloosa County's predominant industry is education. The University of Alabama, Stillman College, Shelton State Community College and the Boards of Education for the City and County of Tuscaloosa comprise the majority of this industry. Other major employers include healthcare providers, such as DCH Regional Medical Center, Northport Medical Center, the Veterans Administration Hospital, and Bryce Hospital.

Manufacturing jobs represent 16% of the non-agricultural workforce and includes Mercedes-Benz, B.F. Goodrich, JVC America, Hunt Refining, Johnson Controls and many more. Bolta, an automotive supply company, is the City of Tuscaloosa's newest industry bringing 350 high-tech manufacturing jobs and a $60 million investment. This addition reflects the diverse economy present in Tuscaloosa County, as companies from France, Germany, Japan, Italy, the U.K., and Canada make investments in the area. Small businesses abound in the construction, finance, transportation and real estate industries and represent 85% of the membership in the Tuscaloosa Chamber of Commerce.

5.8 Repetitively-Damaged NFIP-Insured Structures

FEMA defines *repetitive loss* property as any property with 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. According to the State NFIP Coordinator, Tuscaloosa County and its municipalities have nine repetitively damaged properties, including two single family residences and five non-residential properties within the City of Tuscaloosa and one single family residence and one non-residential property within the City of Northport. Table 5-52 describes the number of policies in force, as well as the total repetitive loss claims and loss amounts. All repetitive loss claims (to date) originate from the cities of Tuscaloosa and Northport. As previously discussed in Section 5.4.3 "Floods Profile," these jurisdictions are susceptible to flooding from the Black Warrior River, Sipsey River, and the various lakes throughout the county. In addition, local street flooding was common due to the strain on municipalities' drainage systems. Furthermore, Table 6-2 "2014-2019 Tuscaloosa County Multi-Jurisdictional Mitigation Action Program" lists the specific goals, objectives, and mitigation measures related to flooding.

Table 5-52. NFIP Policies and Repetitive Loss Claims

Community Name	Total NFIP Policies	Repetitive Loss Structures	Total RL Claims	Total RL Losses ($)	Total Insurance in Force ($)
Brookwood	-	0	0	-	-
Coaling	1	0	0	-	$210,000
Coker	1	0	0	-	$70,000
Lake View	-	0	0	-	-
Moundville	-	0	0	-	-

Community Name	Total NFIP Policies	Repetitive Loss Structures	Total RL Claims	Total RL Losses ($)	Total Insurance in Force ($)
Northport	169	2	4	$32,315.8	$37,188,800
Tuscaloosa	682	7	18	$449,302.2	$128,950,300
Vance	-	0	0	-	-
Woodstock	-	0	0	-	-
Tuscaloosa County	259	0	0	-	$57,827,400
Totals	**1,110**	**9**	**22**	**$481,618**	**$224,246,500**

Source: NFIP State Coordinator, 2014 & FEMA Policy Statistics, 2014

5.9 Summary of Hazards and Community Impacts

Table 5-53 summarizes each jurisdiction's vulnerability. Community impacts include the following descriptions and measurements:

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

1) *Community-wide* - the entire geographic area is affected;
2) *Partial* - a significant portion 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 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 5-53. Summary of Hazards and Community Impacts

Hazard	Jurisdiction	Community Impacts			Impacts on Vulnerable Community Buildings, Critical Facilities, and Infrastructure	
		Location (Geographic Extent of Hazard in the Community)	Probability (Frequency of Hazard Occurrence in the Community)	Extent (Magnitude or Severity of Hazard in the Event of Occurrence)	Level of Exposure (Degree of Structures Exposed to the Hazard)	Level of Damage Potential (Percentage of Likely Damage to Exposed Structures)
Tornadoes	Tuscaloosa County	Community-wide	High	Devastating	High	High
	Brookwood	Community-wide	High	Devastating	High	High
	Coaling	Community-wide	High	Devastating	High	High
	Coker	Community-wide	High	Devastating	High	High
	Lake View	Community-wide	High	Devastating	High	High
	Moundville	Community-wide	High	Devastating	High	High
	Northport	Community-wide	High	Devastating	High	High
	Tuscaloosa	Community-wide	High	Devastating	High	High
	Vance	Community-wide	High	Devastating	High	High
	Woodstock	Community-wide	High	Devastating	High	High
	Unincorporated	Community-wide	High	Devastating	High	High
Severe Storms	Tuscaloosa County	Community-wide	Very High	Significant	High	Low
	Brookwood	Community-wide	Very High	Significant	High	Low
	Coaling	Community-wide	Very High	Significant	High	Low
	Coker	Community-wide	Very High	Significant	High	Low
	Lake View	Community-wide	Very High	Significant	High	Low
	Moundville	Community-wide	Very High	Significant	High	Low
	Northport	Community-wide	Very High	Significant	High	Low
	Tuscaloosa	Community-wide	Very High	Significant	High	Low
	Vance	Community-wide	Very High	Significant	High	Low

Hazard	Jurisdiction	Community Impacts			Impacts on Vulnerable Community Buildings, Critical Facilities, and Infrastructure	
		Location (Geographic Extent of Hazard in the Community)	Probability (Frequency of Hazard Occurrence in the Community)	Extent (Magnitude or Severity of Hazard in the Event of Occurrence)	Level of Exposure (Degree of Structures Exposed to the Hazard)	Level of Damage Potential (Percentage of Likely Damage to Exposed Structures)
	Woodstock	Community-wide	Very High	Significant	High	Low
	Unincorporated	Community-wide	Very High	Significant	High	Low
Floods	Tuscaloosa County	Partial	Very High	Significant	Medium	Medium
	Brookwood	Partial	High	Moderate	Low	Low
	Coaling	Partial	High	Moderate	Low	Low
	Coker	Partial	High	Moderate	Low	Low
	Lake View	Partial	Moderate	Moderate	Low	Low
	Moundville	Partial	Very High	Significant	Medium	Medium
	Northport	Partial	Very High	Significant	Medium	Medium
	Tuscaloosa	Partial	Very High	Significant	Medium	Medium
	Vance	Partial	High	Moderate	Low	Low
	Woodstock	Partial	High	Moderate	Low	Low
	Unincorporated	Partial	High	Moderate	Low	Low
Hurricanes	Tuscaloosa County	Community-wide	Low	Moderate	High	Low
	Brookwood	Community-wide	Low	Moderate	High	Low
	Coaling	Community-wide	Low	Moderate	High	Low
	Coker	Community-wide	Low	Moderate	High	Low
	Lake View	Community-wide	Low	Moderate	High	Low
	Moundville	Community-wide	Low	Moderate	High	Low
	Northport	Community-wide	Low	Moderate	High	Low
	Tuscaloosa	Community-wide	Low	Moderate	High	Low

Hazard	Jurisdiction	Community Impacts			Impacts on Vulnerable Community Buildings, Critical Facilities, and Infrastructure	
		Location (Geographic Extent of Hazard in the Community)	Probability (Frequency of Hazard Occurrence in the Community)	Extent (Magnitude or Severity of Hazard in the Event of Occurrence)	Level of Exposure (Degree of Structures Exposed to the Hazard)	Level of Damage Potential (Percentage of Likely Damage to Exposed Structures)
	Vance	Community-wide	Low	Moderate	High	Low
	Woodstock	Community-wide	Low	Moderate	High	Low
	Unincorporated	Community-wide	Low	Moderate	High	Low
Winter Storms/Freezes	Tuscaloosa County	Community-wide	High	Significant	High	Low
	Brookwood	Community-wide	High	Significant	High	Low
	Coaling	Community-wide	High	Significant	High	Low
	Coker	Community-wide	High	Significant	High	Low
	Lake View	Community-wide	High	Significant	High	Low
	Moundville	Community-wide	High	Significant	High	Low
	Northport	Community-wide	High	Significant	High	Low
	Tuscaloosa	Community-wide	High	Significant	High	Low
	Vance	Community-wide	High	Significant	High	Low
	Woodstock	Community-wide	High	Significant	High	Low
	Unincorporated	Community-wide	High	Significant	High	Low
Drought/Heat Waves	Tuscaloosa County	Community-wide	Moderate	Moderate	High	Low
	Brookwood	Community-wide	Moderate	Moderate	High	Low
	Coaling	Community-wide	Moderate	Moderate	High	Low
	Coker	Community-wide	Moderate	Moderate	High	Low
	Lake View	Community-wide	Moderate	Moderate	High	Low
	Moundville	Community-wide	Moderate	Moderate	High	Low
	Northport	Community-wide	Moderate	Moderate	High	Low

Hazard	Jurisdiction	Community Impacts			Impacts on Vulnerable Community Buildings, Critical Facilities, and Infrastructure	
		Location (Geographic Extent of Hazard in the Community)	Probability (Frequency of Hazard Occurrence in the Community)	Extent (Magnitude or Severity of Hazard in the Event of Occurrence)	Level of Exposure (Degree of Structures Exposed to the Hazard)	Level of Damage Potential (Percentage of Likely Damage to Exposed Structures)
	Tuscaloosa	Community-wide	Moderate	Moderate	High	Low
	Vance	Community-wide	Moderate	Moderate	High	Low
	Woodstock	Community-wide	Moderate	Moderate	High	Low
	Unincorporated	Community-wide	Moderate	Moderate	High	Low
Wildfires	Tuscaloosa County	Partial	Very High	Significant	Medium	High
	Brookwood	Partial	Moderate	Slight	Low	High
	Coaling	Partial	Moderate	Slight	Low	High
	Coker	Partial	Moderate	Slight	Low	High
	Lake View	Partial	Moderate	Slight	Low	High
	Moundville	Partial	Moderate	Slight	Low	High
	Northport	Partial	Low	Slight	Low	High
	Tuscaloosa	Partial	Low	Slight	Low	High
	Vance	Partial	Moderate	Slight	Low	High
	Woodstock	Partial	Moderate	Slight	Low	High
	Unincorporated	Partial	Very High	Significant	Medium	High
Dam/Levee Failures	Tuscaloosa County	Minimal	Low	Slight	Low	Low
	Brookwood	Minimal	Low	Slight	Low	Low
	Coaling	Minimal	Low	Slight	Low	Low
	Coker	Minimal	Low	Slight	Low	Low
	Lake View	Minimal	Low	Slight	Low	Low
	Moundville	Minimal	Low	Slight	Low	Low

Hazard	Jurisdiction	Community Impacts			Impacts on Vulnerable Community Buildings, Critical Facilities, and Infrastructure	
		Location (Geographic Extent of Hazard in the Community)	Probability (Frequency of Hazard Occurrence in the Community)	Extent (Magnitude or Severity of Hazard in the Event of Occurrence)	Level of Exposure (Degree of Structures Exposed to the Hazard)	Level of Damage Potential (Percentage of Likely Damage to Exposed Structures)
	Northport	Minimal	Low	Slight	Low	Low
	Tuscaloosa	Minimal	Low	Slight	Low	Low
	Vance	Minimal	Low	Slight	Low	Low
	Woodstock	Minimal	Low	Slight	Low	Low
	Unincorporated	Minimal	Low	Slight	Low	Low
Landslides	Tuscaloosa County	Minimal	Moderate	Slight	Low	Low
	Brookwood	Minimal	Low	Slight	Low	Low
	Coaling	Minimal	Moderate	Slight	Low	Low
	Coker	Minimal	Moderate	Slight	Low	Low
	Lake View	Minimal	Low	Slight	Low	Low
	Moundville	Minimal	Low	Slight	Low	Low
	Northport	Minimal	Low	Slight	Low	Low
	Tuscaloosa	Minimal	Low	Slight	Low	Low
	Vance	Minimal	Low	Slight	Low	Low
	Woodstock	Minimal	Low	Slight	Low	Low
	Unincorporated	Minimal	Moderate	Slight	Low	Low
Earthquakes	Tuscaloosa County	Community-wide	Very Low	Slight	High	Medium
	Brookwood	Community-wide	Very Low	Slight	High	Medium
	Coaling	Community-wide	Very Low	Slight	Medium	Low
	Coker	Community-wide	Very Low	Slight	High	Medium
	Lake View	Community-wide	Very Low	Slight	High	Medium

Hazard	Jurisdiction	Community Impacts			Impacts on Vulnerable Community Buildings, Critical Facilities, and Infrastructure	
		Location (Geographic Extent of Hazard in the Community)	Probability (Frequency of Hazard Occurrence in the Community)	Extent (Magnitude or Severity of Hazard in the Event of Occurrence)	Level of Exposure (Degree of Structures Exposed to the Hazard)	Level of Damage Potential (Percentage of Likely Damage to Exposed Structures)
	Moundville	Community-wide	Very Low	Slight	High	Medium
	Northport	Community-wide	Very Low	Slight	High	Medium
	Tuscaloosa	Community-wide	Very Low	Slight	High	Medium
	Vance	Community-wide	Very Low	Slight	High	Medium
	Woodstock	Community-wide	Very Low	Slight	High	Medium
	Unincorporated	Community-wide	Very Low	Slight	High	Medium
Sinkholes (Land Subsidence)	Tuscaloosa County	Minimal	Moderate	Moderate	Medium	Low
	Brookwood	Minimal	Moderate	Moderate	Low	Low
	Coaling	Minimal	Moderate	Moderate	Low	Low
	Coker	Minimal	Low	Slight	Low	Low
	Lake View	Minimal	Moderate	Moderate	Low	Low
	Moundville	Minimal	Low	Slight	Low	Low
	Northport	Minimal	Moderate	Moderate	Medium	Low
	Tuscaloosa	Minimal	Moderate	Moderate	Medium	Low
	Vance	Minimal	Moderate	Moderate	Low	Low
	Woodstock	Minimal	Low	Slight	Low	Low
	Unincorporated	Minimal	Moderate	Moderate	Low	Low
Manmade & Technological	Tuscaloosa County	Community-wide	Very High	Varies	High	Varies
	Brookwood	Community-wide	Very High	Varies	High	Varies
	Coaling	Community-wide	Very High	Varies	High	Varies
	Coker	Community-wide	Very High	Varies	High	Varies

Hazard	Jurisdiction	Community Impacts			Impacts on Vulnerable Community Buildings, Critical Facilities, and Infrastructure	
		Location (Geographic Extent of Hazard in the Community)	Probability (Frequency of Hazard Occurrence in the Community)	Extent (Magnitude or Severity of Hazard in the Event of Occurrence)	Level of Exposure (Degree of Structures Exposed to the Hazard)	Level of Damage Potential (Percentage of Likely Damage to Exposed Structures)
	Lake View	Community-wide	Very High	Varies	High	Varies
	Moundville	Community-wide	Very High	Varies	High	Varies
	Northport	Community-wide	Very High	Varies	High	Varies
	Tuscaloosa	Community-wide	Very High	Varies	High	Varies
	Vance	Community-wide	Very High	Varies	High	Varies
	Woodstock	Community-wide	Very High	Varies	High	Varies
	Unincorporated	Community-wide	Very High	Varies	High	Varies

5.10 Risks that Vary Among the Jurisdictions

This Plan has strongly emphasized the variations in risks among jurisdictions. In particular, the following sections contain specific references to jurisdictional variations:

- Hazard identification. Each jurisdiction was independently assessed to identify pertinent hazards, based on the sources noted in Section 5.3 "Identification of Hazards Affecting Each Jurisdiction." Descriptions of hazards can be found in Appendix D, "Hazard Identification, Ratings and Descriptions".
- Hazard profiles. Each of the hazard profiles in Section 5.4 notes how the location, extent, past occurrences, and probability of future events may vary among all jurisdictions. Maps are included, where possible, to emphasize the locations of hazards in relation to jurisdictional limits.
- Summary of Community Impacts. Table 5-53 "Summary of Hazards and Community Impacts" summarizes how hazards impact each jurisdiction.

Risk may vary among jurisdictions, as described in Table 5-54 "Jurisdictional Risk Variations." This table 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 locations* - the hazard only threatens particular parts of the jurisdiction; or
2) *Not unique* - the hazard affects all parts of the jurisdiction (if the location of a hazard is not unique, then it follows that the probability and the extent will also be marked not unique)

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 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.

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Table 5-54. Jurisdictional Risk Variations

Hazard	Variation of Risks	Jurisdiction	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
Tornadoes	Common Risks	Tuscaloosa Co.	Not Unique	Not Unique	Not Unique
		Brookwood	Not Unique	Not Unique	Not Unique
		Coaling	Not Unique	Not Unique	Not Unique
		Coker	Not Unique	Not Unique	Not Unique
		Lake View	Not Unique	Not Unique	Not Unique
		Moundville	Not Unique	Not Unique	Not Unique
		Northport	Not Unique	Not Unique	Not Unique
		Tuscaloosa	Not Unique	Not Unique	Not Unique
		Vance	Not Unique	Not Unique	Not Unique
		Woodstock	Not Unique	Not Unique	Not Unique
		Unincorporated	Not Unique	Not Unique	Not Unique
Severe Storms	Common Risks	Tuscaloosa Co.	Not Unique	Not Unique	Not Unique
		Brookwood	Not Unique	Not Unique	Not Unique
		Coaling	Not Unique	Not Unique	Not Unique
		Coker	Not Unique	Not Unique	Not Unique
		Lake View	Not Unique	Not Unique	Not Unique
		Moundville	Not Unique	Not Unique	Not Unique
		Northport	Not Unique	Not Unique	Not Unique
		Tuscaloosa	Not Unique	Not Unique	Not Unique
		Vance	Not Unique	Not Unique	Not Unique
		Woodstock	Not Unique	Not Unique	Not Unique
		Unincorporated	Not Unique	Not Unique	Not Unique

Hazard	Variation of Risks	Jurisdiction	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
Floods	Common Risks	Tuscaloosa Co.	Not Unique	Not Unique	Not Unique
		Brookwood	Not Unique	Not Unique	Not Unique
		Coaling	Not Unique	Not Unique	Not Unique
		Coker	Not Unique	Not Unique	Not Unique
		Lake View	Not Unique	Not Unique	Not Unique
		Moundville	Not Unique	Not Unique	Not Unique
		Northport	Not Unique	Not Unique	Not Unique
		Tuscaloosa	Not Unique	Not Unique	Not Unique
		Vance	Not Unique	Not Unique	Not Unique
		Woodstock	Not Unique	Not Unique	Not Unique
		Unincorporated	Not Unique	Not Unique	Not Unique
Hurricanes	Common Risks	Tuscaloosa Co.	Not Unique	Not Unique	Not Unique
		Brookwood	Not Unique	Not Unique	Not Unique
		Coaling	Not Unique	Not Unique	Not Unique
		Coker	Not Unique	Not Unique	Not Unique
		Lake View	Not Unique	Not Unique	Not Unique
		Moundville	Not Unique	Not Unique	Not Unique
		Northport	Not Unique	Not Unique	Not Unique
		Tuscaloosa	Not Unique	Not Unique	Not Unique
		Vance	Not Unique	Not Unique	Not Unique
		Woodstock	Not Unique	Not Unique	Not Unique
		Unincorporated	Not Unique	Not Unique	Not Unique

Hazard	Variation of Risks	Jurisdiction	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
Winter Storms/Freezes	Common Risks	Tuscaloosa Co.	Not Unique	Not Unique	Not Unique
		Brookwood	Not Unique	Not Unique	Not Unique
		Coaling	Not Unique	Not Unique	Not Unique
		Coker	Not Unique	Not Unique	Not Unique
		Lake View	Not Unique	Not Unique	Not Unique
		Moundville	Not Unique	Not Unique	Not Unique
		Northport	Not Unique	Not Unique	Not Unique
		Tuscaloosa	Not Unique	Not Unique	Not Unique
		Vance	Not Unique	Not Unique	Not Unique
		Woodstock	Not Unique	Not Unique	Not Unique
		Unincorporated	Not Unique	Not Unique	Not Unique
Drought/Heat Waves	Common Risks	Tuscaloosa Co.	Not Unique	Not Unique	Not Unique
		Brookwood	Not Unique	Not Unique	Not Unique
		Coaling	Not Unique	Not Unique	Not Unique
		Coker	Not Unique	Not Unique	Not Unique
		Lake View	Not Unique	Not Unique	Not Unique
		Moundville	Not Unique	Not Unique	Not Unique
		Northport	Not Unique	Not Unique	Not Unique
		Tuscaloosa	Not Unique	Not Unique	Not Unique
		Vance	Not Unique	Not Unique	Not Unique
		Woodstock	Not Unique	Not Unique	Not Unique
		Unincorporated	Not Unique	Not Unique	Not Unique

Hazard	Variation of Risks	Jurisdiction	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
Wildfires	Unique Risks	Tuscaloosa Co.	Specific Locations	Very High	Significant
		Brookwood	Specific Locations	Very High	Moderate
		Coaling	Specific Locations	Very High	Moderate
		Coker	Specific Locations	Very High	Moderate
		Lake View	Specific Locations	Very High	Moderate
		Moundville	Specific Locations	Very High	Moderate
		Northport	Specific Locations	Very High	Moderate
		Tuscaloosa	Specific Locations	Very High	Moderate
		Vance	Specific Locations	Very High	Moderate
		Woodstock	Specific Locations	Very High	Moderate
		Unincorporated	Specific Locations	Very High	Significant
Dam/Levee Failures	Unique Risks	Tuscaloosa Co.	Specific Locations	Low	Moderate
		Brookwood	Specific Locations	Low	Moderate
		Coaling	Specific Locations	Low	Moderate
		Coker	Specific Locations	Low	Moderate
		Lake View	Specific Locations	Low	Moderate
		Moundville	Specific Locations	Low	Moderate
		Northport	Specific Locations	Low	Moderate
		Tuscaloosa	Specific Locations	Low	Moderate
		Vance	Specific Locations	Low	Moderate
		Woodstock	Specific Locations	Low	Moderate
		Unincorporated	Specific Locations	Low	Moderate

Hazard	Variation of Risks	Jurisdiction	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
Landslides	Unique Risks	Tuscaloosa Co.	Specific Locations	Low	Slight
		Brookwood	Specific Locations	Low	Slight
		Coaling	Specific Locations	Low	Slight
		Coker	Specific Locations	Low	Slight
		Lake View	Specific Locations	Low	Slight
		Moundville	Specific Locations	Low	Slight
		Northport	Specific Locations	Low	Slight
		Tuscaloosa	Specific Locations	Low	Slight
		Vance	Specific Locations	Low	Slight
		Woodstock	Specific Locations	Low	Slight
		Unincorporated	Specific Locations	Low	Slight
Earthquakes	Common Risks	Tuscaloosa Co.	Not Unique	Not Unique	Not Unique
		Brookwood	Not Unique	Not Unique	Not Unique
		Coaling	Not Unique	Not Unique	Not Unique
		Coker	Not Unique	Not Unique	Not Unique
		Lake View	Not Unique	Not Unique	Not Unique
		Moundville	Not Unique	Not Unique	Not Unique
		Northport	Not Unique	Not Unique	Not Unique
		Tuscaloosa	Not Unique	Not Unique	Not Unique
		Vance	Not Unique	Not Unique	Not Unique
		Woodstock	Not Unique	Not Unique	Not Unique
		Unincorporated	Not Unique	Not Unique	Not Unique

Hazard	Variation of Risks	Jurisdiction	Hazard's Unique Risk Characteristics		
			Location	Probability	Extent
Sinkholes (Land Subsidence)	Unique Risks	Tuscaloosa Co.	Specific Locations	Moderate	Moderate
		Brookwood	Specific Locations	Moderate	Moderate
		Coaling	Specific Locations	Moderate	Moderate
		Coker	Specific Locations	Moderate	Moderate
		Lake View	Specific Locations	Moderate	Moderate
		Moundville	Specific Locations	Moderate	Moderate
		Northport	Specific Locations	Moderate	Moderate
		Tuscaloosa	Specific Locations	Moderate	Moderate
		Vance	Specific Locations	Moderate	Moderate
		Woodstock	Specific Locations	Moderate	Moderate
		Unincorporated	Specific Locations	Moderate	Moderate
Manmade & Technological	Common Risks	Tuscaloosa Co.	Not Unique	Not Unique	Not Unique
		Brookwood	Not Unique	Not Unique	Not Unique
		Coaling	Not Unique	Not Unique	Not Unique
		Coker	Not Unique	Not Unique	Not Unique
		Lake View	Not Unique	Not Unique	Not Unique
		Moundville	Not Unique	Not Unique	Not Unique
		Northport	Not Unique	Not Unique	Not Unique
		Tuscaloosa	Not Unique	Not Unique	Not Unique
		Vance	Not Unique	Not Unique	Not Unique
		Woodstock	Not Unique	Not Unique	Not Unique
		Unincorporated	Not Unique	Not Unique	Not Unique

Chapter 6 – Mitigation Strategy

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

This Chapter replaces Mitigation Strategies portion of each Community Profile within the 2009 Tuscaloosa County Plan Update in its entirety.

6.3 Goals for Hazard Mitigation

6.3.1 Description of How the Goals were Developed

The goals in the previous plans have been updated based on current conditions, including the following factors, among others:

- The completion of mitigation measures over the five-year plan implementation cycle (see Appendix C “2009 Plan Implementation Status”);
- The 2014 update to the risk assessment in Chapter 5;
- The update to the risk assessment in the 2013 Alabama State Hazard Mitigation Plan; and
- The update of State goals and mitigation priorities reflected in the State Plan.

The Hazard Mitigation Planning Committee (HMPC) evaluated the validity and effectiveness of the goals from the previous 2009 plan and determined that all of the goals statements and objectives should be updated for the 2014 plan update. The HMPC selected among available mitigation measures that best respond to the considerations listed in the next paragraph (see Appendix F “Alternative Mitigation Measures”). The 2009 implementation status report in Appendix C “2009 Plan Implementation Status” documents which measures have been completed.

Among the considerations reviewed by the planning team during the process of updating this goals section of the mitigation strategy were the following concerns:

- Whether the 2014 goals and objectives reflected the updates to the local risk assessment and the 2013 update to the State risk assessment;
- Whether the 2014 goals and objectives effectively directed mitigation actions and projects that helped reduce vulnerability to property and infrastructure;
- Whether the 2014 goals and objectives support the changed 2013 mitigation priorities established by the HMPC; and
- Whether the 2014 goals reflect the adopted goals in the 2013 Alabama State Hazard Mitigation Plan.

The updated goals are presented in Section 6.3.3 “Community Goals” and have also been incorporated into the “Community Action Programs” in Volume II.

As further explained in Appendix F, a strategic planning approach has been used for identification and analysis of mitigation actions and projects. FEMA’s program categories for managing a successful mitigation program were used as guidelines for identifying and sorting the alternative mitigation measures:

- **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 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.
- **Public Education and Outreach.** 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.

The comprehensive listing of alternative mitigation measures within each of the above mitigation program areas was developed by the planning team (refer to Appendix F "Identification and Analysis of Mitigation Measures"). The process by which the Hazard Mitigation Planning Committee (HMPC) and local jurisdictions finally selected among the available mitigation measures applied the STAPLEE method. STAPLEE examines social, technical, administrative, political, legal, environmental, and economic considerations.

HMPC representatives from each jurisdiction participated in the evaluation and selection of the mitigation measures. Not all of the mitigation measures initially considered were included in the final Community Action Programs (see Volume II "Community Action Programs"). The STAPLEE evaluation eliminated many of the measures. Also, some communities did not have the capabilities to carry out a particular measure under consideration or had other concerns revealed by the STAPLEE method.

A capability assessment was performed by the planning team to determine each participating community's capability to implement their selected mitigation action program. A report of the assessment is documented in Appendix B - "Community Mitigation Capabilities." The assessment includes, among other capability factors, a review of local plans, studies, regulatory tools and other local planning tools. Mitigation measures to improve these tools to better integrate mitigation objectives were considered and, where deemed appropriate, selected for the action programs.

In addition to STAPLEE and community capabilities, the communities examined other evaluation criteria, including consistency with the vision, goals, and objectives established for the 2014 plan update; cost effectiveness in terms of benefit to cost; FEMA and State funding priorities for Hazard Mitigation Assistance grants; and the fiscal and staffing capabilities of the jurisdictions for carrying out the measures.

The "2014-2019 Tuscaloosa County Multi-Jurisdictional Mitigation Action Program," as presented in Table 6-2 in Section 6.5, presents all the goals, objectives and measures chosen by each of the participating jurisdictions. The Community Action Programs in Volume II, which supplements Table 6-2, breaks out the same mitigation goals, objectives, and mitigation measures by community and adds the priority, timeframe for completion, and responsibility for implementation.

6.3.2 The Vision for Disaster-Resistant Tuscaloosa County Communities

The communities of Tuscaloosa 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-made 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.

This shared vision among all Tuscaloosa County local governments can be achieved through a long-term hazard mitigation strategy that fully responds to the following hazards identified by this plan:

- Tornadoes,
- Severe Storms,
- Floods,
- Winter Storms/Freezes,
- Hurricanes,
- Droughts/Heat Waves,
- Wildfires,
- Dam/Levee Failures,
- Landslides,
- Earthquakes,
- Sinkholes,
- Man-Made and Technological

The attainment of this vision requires successful implementation of a comprehensive range of mitigation measures that promote the following underlying principles and purposes:

- To reduce or eliminate risks from natural and man-made hazards.
- To reduce the vulnerability of existing, new, and future development of buildings and infrastructure.
- To minimize exposure and vulnerability of people, buildings, critical facilities, and infrastructure to identified hazards.
- To increase public awareness and support of hazard mitigation.
- To establish interagency cooperation for conducting hazard mitigation activities.
- To strengthen communications and coordination among individuals and organizations.
- To integrate local hazard mitigation planning with State hazard mitigation planning, local comprehensive planning activities, and emergency operations planning.
- To protect people and property and reduce losses and damages to buildings and infrastructure.

6.3.3 Community Goals

The goals to guide the Mitigation Strategy and achieve the long-range vision shared among Tuscaloosa County communities are presented here:

1. **Prevention Goal.** Manage the development of land and buildings to minimize risks of loss due to natural hazards.
2. **Property Protection Goal.** Protect structures and their occupants and contents from the damaging effects of natural hazards.
3. **Public Education and Awareness Goal.** Educate and inform the public about the risks of hazards and the techniques available to reduce threats to life and property.
4. **Natural Resources Protection Goal.** 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.
5. **Structural Projects Goal.** Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of hazards, where found to be feasible, cost effective, and environmentally suitable.

6.3.4 Compatibility with 2013 Alabama State Plan Goals

The 2014 Tuscaloosa County vision, goals, and objectives are reflective of the goals adopted in the 2013 Alabama State Hazard Mitigation Plan. The State plan includes the following five goals for statewide hazard mitigation:

1. Establish a comprehensive statewide hazard mitigation system.
2. Reduce the State of Alabama's vulnerability to natural hazards.
3. Reduce vulnerability of new and future development.
4. Foster public support and acceptance of hazard mitigation.
5. Expand and promote interagency hazard mitigation cooperation.

Alabama local governments, including Tuscaloosa County communities, are the fundamental building blocks of the "comprehensive statewide hazard mitigation system." The underlying principles and purposes of the 2014 Tuscaloosa County goals, listed in Subsection 6.3.2 complement the remaining five State goals, as follows: (a) to reduce or eliminate risks from natural and man-made hazards; (b) to reduce the vulnerability of existing, new, and future development of buildings and infrastructure; (c) to minimize exposure and vulnerability of people, buildings, critical facilities, and infrastructure to identified hazards; (d) to increase public awareness and support of hazard mitigation; and (e) to establish interagency cooperation for conducting hazard mitigation activities.

6.4 Participation and Compliance with the National Flood Insurance Program (NFIP)

Tuscaloosa County and its municipal jurisdictions have been mapped and the floodplain identified. All jurisdictions within Tuscaloosa County are members in good standing with the NFIP. All of these jurisdictions had their maps updated in 2014. All NFIP communities in Tuscaloosa County have continued to effectively enforce and keep their floodplain ordinances current since their original entry into the program. Local flood plain ordinance administrators provide technical assistance to applicants and keep abreast of changes in floodplain management requirements through the State NFIP Coordinator. All communities have developed five-year action programs to improve local flood plain management programs (see specific action items for each community in Section 6.7, Goal 1 Prevention, Objective 1.5 "Flood Plain Management Program.") Demonstrations of community commitment to effective implementation of the NFIP include the following actions:

- Longstanding records of continuous and effective enforcement of flood plain management ordinance requirements;
- Continuing education of local flood plain administrators;

- Community outreach to inform builders and property owners of flood plain management ordinance permitting requirements;
- Continuing updates of local flood plain ordinances for compliance with the most current NFIP standards;
- Ongoing relations by each community with the State NFIP Coordinator;
- Monitoring flooding events and damages in conjunction with the Tuscaloosa 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 Tuscaloosa County EMA as technical support resources to local flood plain administrators and as public education information for the general public.

The following Table 6-1 provides information on the NFIP participation status of Tuscaloosa County jurisdictions:

Table 6-1. NFIP Community Status, Tuscaloosa County Jurisdictions

Community ID	Jurisdiction	Current Effective Map Date	Status
010201	Tuscaloosa County	01/16/14	Participating
010431	Brookwood	01/16/14	Participating
010480	Coaling	01/16/14	Participating
010481	Coker	01/16/14	Participating
010483	Lake View	01/16/14	Participating
010202	Northport	01/16/14	Participating
010203	Tuscaloosa	01/16/14	Participating
010428	Vance	01/16/14	Participating

(M)=No Elevations Determined - All Zone A, C and X
Source: NFIP Community Status Book, 09/04/2014

6.5 Implementation of Mitigation Actions

The range of measures described in Section 6.3 “Goals for Hazard Mitigation” was the source for all actions and projects selected by the Hazard Mitigation Planning Committee (HMPC) and the planning team for inclusion in the five-year Community Mitigation Action Programs for each jurisdiction (see Volume II). Each jurisdiction assigned a priority to selected measures, established a general completion schedule, assigned administrative responsibility for carrying out the measures, estimated costs, where possible, and identified potential funding sources, including potential eligibility for FEMA Hazard Mitigation Assistance Programs.

Social, technical, administrative, political, legal, environmental, and economic considerations – often referred to as the STAPLEE method – guided the evaluation of the range of measures considered by the Hazard Mitigation Planning Committee (HMPC) and its final recommended action programs for each participating jurisdictions. 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 resources.* 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 loads?
   - *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 be in compliance with State and local environmental laws, such as flood plain 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?

The STAPLEE evaluation also facilitated the prioritization of measures. 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 to reducing damages against costs 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.

In addition to the STAPLEE evaluation, the April 27, 2011 tornado outbreak that devastated the City of Tuscaloosa and outlying communities had the most influence over the selection of mitigation measures. That disaster raised awareness of the need to take steps now to prevent future losses, which is the essence of hazard mitigation. All Tuscaloosa County communities have included mitigation measures to encourage the construction of community safe rooms, individual safe rooms, and hardening of appropriate spaces within existing and future public buildings. Moreover, the needs for sirens and generators have been recognized as priority measures. A comparison between the 2009 and 2014 community action programs illustrates these shifts in priorities.

All of the above considerations and prioritization methods resulted in the final goals, objectives, and mitigation measures presented in Table 6.2 “2014-2019 Tuscaloosa County Multi-Jurisdictional Mitigation Action Program” and Volume II “Community Action Programs,” which supplements Table 6.2.

Table 6-2. 2014-2019 Tuscaloosa County Multi-Jurisdictional Mitigation Action Program

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
1	**Goal for Prevention.** Manage the development of land and buildings to minimize risks of loss due to natural 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 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.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Tuscaloosa, Vance	All	Both	Action	Existing Funds
1.1.2	Integrate the findings and recommendations of this plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Tuscaloosa, Vance	All	B both	Action	Existing Funds
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.	Tuscaloosa County, Brookwood, Coker, Lake View, Tuscaloosa, Vance	All	Both	Action	Existing Funds
1.2	**Geographic Information Systems (GIS). Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories.**					
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, hurricane surge areas, tornado tracks, disaster events and their extents, and a comprehensive inventory of critical facilities within all jurisdictions.	Tuscaloosa County, Brookwood, Coker, Lake View, Tuscaloosa, Vance	All	Both	Action	Existing Funds
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.	Tuscaloosa County, Brookwood, Coker, Lake View, Tuscaloosa, Vance	All	Both	Action	Existing Funds

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
1.2.3	Mark depths of flooding and storm surge immediately after each event. Enter and maintain these historical records in GIS.	Brookwood, Coker, Lake View, Northport, Tuscaloosa	Flooding	Both	Action	Existing Funds
1.3	**Planning Studies. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**					
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.	Brookwood, Coker, Lake View, Northport, Tuscaloosa	Flooding	Both	Action	TBD
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.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Tuscaloosa	All	Existing	Action	TBD
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.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Tuscaloosa	Flooding	Existing	Action	TBD
1.3.4	Inventory and map existing fire hydrants throughout the county, and identify areas in need of new fire hydrants.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Vance	Wildfires	Existing	Action	Existing Funds
1.3.5	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Tuscaloosa	Flooding	Both	Action	TBD
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.	Coker, Lake View, Northport, Tuscaloosa	Earthquake	Existing	Project	TBD
1.4	**Zoning. Establish effective zoning controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**					
1.4.1	Consider large lot size restrictions on flood prone areas designated on Flood Insurance Rate Maps.	Brookwood, Coker, Lake View, Northport, Tuscaloosa, Vance	Flooding	Both	Action	Existing Funds

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
1.4.2	Evaluate additional land use restrictions within designated flood zones, such as prohibition of storage of buoyant materials, storage of hazardous materials, restrictive development of flood ways, among others.	Tuscaloosa County, Brookwood, Coker, Northport, Tuscaloosa, Vance	Flooding	Both	Action	Existing Funds
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.	Tuscaloosa County, Brookwood, Coker, Northport, Tuscaloosa	Flooding	Both	Action	Existing Funds
1.4.4	Enact local ordinance that require community storm shelters within sizeable mobile home parks and subdivisions.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Northport, Tuscaloosa	Tornadoes, Hurricanes, Severe Storms	New	Action	Existing Funds
1.5	**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 parks, conservation areas, landscaping, and drainage.**					
1.5.1	Examine regulatory options and feasibility of requiring open space areas for recreation, landscaping, and drainage control.	Tuscaloosa, County, Brookwood, Coker, Lake View, Northport, Tuscaloosa	Flooding	New	Action	Existing Funds
1.6	**Flood Plain Management Regulations. Effectively administer and enforce local floodplain management regulations.**					
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.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Tuscaloosa, Vance	Flooding	Both	Action	Existing Funds
1.6.2	Maintain a library of technical assistance and guidance materials to support the local floodplain manager.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Vance	Flooding	Both	Action	Existing Funds
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.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Vance	Flooding	Both	Action	Existing Funds

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
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.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Tuscaloosa, Vance	Flooding	Both	Action	Existing Funds
1.6.5	Participate in the "Turn Around Don't Drown" program by purchasing and installing signs in known flash flood bridge overpass locations.	Brookwood, Coker, Lake View, Northport, Tuscaloosa	Flooding	Existing	Project	Existing Funds
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.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Tuscaloosa	Flooding	Both	Project	Existing Funds
1.7	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from natural hazard damages.**					
1.7.1	Promote good construction practices and proper code enforcement to mitigate structural failures during natural hazard events.	Brookwood, Coaling, Coker, Lake View, Northport, Tuscaloosa, Vance	All	New	Action	Existing Funds
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."	Brookwood, Coker, Lake View, Northport, Tuscaloosa, Vance	Tornadoes, Hurricanes, Severe Storms	New	Action	Existing Funds
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.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Tuscaloosa	Tornadoes, severe storms, winter storms/freezes, hurricanes	Both	Action	TBD
1.7.4	Ensure fire safety ordinances properly regulate open burning, the use of liquid fuel and electric space heaters.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Northport, Tuscaloosa, Vance	Wildfires	Both	Action	Existing Funds
1.7.5	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Northport, Tuscaloosa, Vance	All	Existing	Action	Existing Funds

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
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.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Tuscaloosa	Tornadoes, Hurricanes, Severe Storms	New	Project	Existing Funds
1.8	**<u>Landscape Ordinances.</u> Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff and improve urban aesthetics.**					
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.	Brookwood, Coker, Lake View, Northport, Tuscaloosa, Vance,	Flooding	New	Action	Existing Funds
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.	Tuscaloosa County, Brookwood, Coaling, Coker,	Wildfires	Both	Action	Existing Funds
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.	Brookwood, Coker, Northport, Tuscaloosa,	Wildfires	Both	Action	Existing Funds
1.9	**<u>Storm Water Management.</u> Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**					
1.9.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Tuscaloosa, Vance	Flooding	Existing	Action	Existing Funds
1.9.2	Develop, adopt and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Tuscaloosa, Vance,	Flooding	Existing	Action	Existing Funds
1.9.3	Establish urban forestry program to help mitigate storm water runoff common in areas with large impervious surfaces.	Coker, Northport, Lake View	Flooding	Both	Action	Existing Funds
1.10	**<u>Dam Safety Management.</u> Establish a comprehensive dam safety program.**					

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
1.10.1	Support legislation to establish a State dam safety program.	Tuscaloosa County, Lake View, Northport, Tuscaloosa	Dam/Levee Failure	Both	Action	Existing Funds
1.11	**<u>Community Rating System Program (CRS).</u> Increase participation of NFIP member communities in the CRS Program.**					
1.11.1	Apply for/maintain membership in the CRS Program; continue to upgrade rating.	Brookwood, Lake View, Northport,	Flooding	Both	Action	Existing Funds
1.12	**<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 disaster events.**					
1.12.1	Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards.	Tuscaloosa County, Coker, Lake View, Northport, Tuscaloosa	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Existing	Action	TBD
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.	Tuscaloosa County, Brookwood, Coker, Lake View, Tuscaloosa	Wildfire	Both	Project	TBD
2	**<u>Goal for Property Protection:</u> Protect structures and their occupants and contents from the damaging effects of natural hazards.**					
2.1	**<u>Building Relocation.</u> 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.	Coker, Northport, Tuscaloosa	Flooding	Existing	Project	FEMA HMA Grant

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
2.2	**<u>Acquisition.</u> Acquire flood prone buildings and properties and establish permanent open space.**					
2.2.1	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	Flooding	Existing	Project	FEMA HMA Grant
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.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	Flooding	Existing	Project	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; where feasible, elevation is preferable to flood proofing.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	Flooding	Existing	Project	FEMA HMA Grant
2.3.2	Repair, elevate and weatherize existing homes for low- to moderate-income families.	Coker, Northport, Tuscaloosa	Flooding	Existing	Project	FEMA HMA Grant
2.4	**<u>Flood Proofing.</u> Encourage flood proofing of buildings in hazardous flood areas to safeguard against damages.**					
2.4.1	Flood proof pre-FIRM non-residential buildings, where feasible.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	Flooding	Existing	Project	FEMA HMA Grant

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
2.4.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	Flooding	Both	Project	FEMA HMA Grant
2.5	**<u>Building Retrofits</u>. Retrofit vulnerable buildings to protect against natural hazards damages, including flooding, high winds, tornadoes, hurricanes, severe storms, and earthquakes.**					
2.5.1	Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock,	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Existing	Action	FEMA HMA Grant
2.5.2	Provide technical advisory assistance to building owners on available building retrofits to protect against natural hazards damages.	Tuscaloosa County, Brookwood, Coker, Northport, Tuscaloosa	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Existing	Action	FEMA HMA Grant
2.6	**<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.**					
2.6.1	Promote the purchase of insurance coverage by property owners and renters for flood damages in high-risk areas.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Northport, Tuscaloosa,	All	Existing	Action	Existing Funds
2.6.2	Promote the purchase of crop insurance to cover potential losses due to drought.	Tuscaloosa County, Coker, Lake View	Drought	Existing	Action	Existing Funds
2.7	**<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 or construction of new facilities for maximum protection from all hazards.**					
2.7.1	Install lightning and/or surge protection on existing critical facilities.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Northport, Tuscaloosa, Vance	Severe storms	Existing	Project	FEMA HMA Grant

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
2.7.2	Conduct ongoing tree trimming programs along power lines.	Tuscaloosa County, Brookwood, Coaling, Coker, Tuscaloosa	Severe storms	Existing	Action	TBD
2.8	**Back Up Power: Assure uninterrupted power supplies during emergency events.**					
2.8.1	Install backup power generators for critical facilities.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	Hurricanes, Tornadoes, Severe Storms	Existing	Project	FEMA HMA Grant
3	**Goal for Public Education and Outreach. Educate and inform the public about the risks of hazards and the techniques available to reduce threats to life and property.**					
3.1	**Map Information. Increase public access to Flood Insurance Rate Map (FIRM) information.**					
3.1.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications and newspaper announcements.	Brookwood, Northport, Tuscaloosa	All	Both	Action	Existing Funds
3.2	**Outreach Projects. Conduct regular public events to inform the public of hazards and mitigation measures.**					
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.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	All	Both	Action	Existing Funds
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.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	All	Existing	Action	Existing Funds

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
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.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	All	Both	Action	Existing Funds
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.	Tuscaloosa County, Coker, Lake View, Northport,	Flooding	Both	Action	Existing Funds
3.2.5	Educate citizens on water saving techniques.	Tuscaloosa County, Coaling, Coker, Northport, Tuscaloosa	Drought	Both	Action	Existing Funds
3.2.6	Educate farmers on soil and water conservation practices.	Tuscaloosa County, Coaling, Coker,	Drought	Both	Action	Existing Funds
3.3	**Real Estate Disclosure. Encourage real estate agents to disclose flood plain location for property listings.**					
3.3.1	Arrange with the Multiple Listing Service (MLS) to require floodplain location disclosure as a condition for each real estate listing.	Tuscaloosa County, Coker, Lake View, Northport, Tuscaloosa	Flooding	Existing	Action	Existing Funds
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.	Tuscaloosa County, Coker, Lake View, Northport, Tuscaloosa	Flooding	Existing	Action	Existing Funds
3.4	**Library. Use local library resources to educate the public on hazard risks and mitigation alternatives.**					
3.4.1	Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	All	Both	Action	Existing Funds

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
3.5	**<u>Education Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**					
3.5.1	Distribute hazard mitigation brochures to students through area schools.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Tuscaloosa	All	Both	Action	Existing Funds
3.5.2	Educate homeowners about structural and non-structural retrofitting of vulnerable homes.	Tuscaloosa County, Coker, Northport, Tuscaloosa	Earthquake	Both	Action	Existing Funds
3.6	**<u>Community Hazard Mitigation Plan Distribution</u>. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**					
3.6.1	Distribute the 2014 plan to local officials, stakeholders, and interested individuals through internet download.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	All	Both	Action	Existing Funds
3.7	**<u>Technical Assistance</u>. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**					
3.7.1	Provide technical assistance to homeowners, builders, and developers on flood protection alternatives.	Tuscaloosa County, Brookwood, Coker, Lake View, Northport, Tuscaloosa, Vance	Flooding	Both	Action	Existing Funds
3.8	**<u>Mass Media Relations</u>. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, and on-line social networking to increase public awareness and distribute public information on hazard mitigation topics.**					
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.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	All	Both	Action	Existing Funds

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
3.9	**Weather Radios. Improve public access to weather alerts.**					
3.9.1	Promote the use of weather radios in households and businesses.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Northport, Tuscaloosa, Vance	All	Both	Action	Existing Funds
3.9.2	Require the installation of weather radios in all public buildings and places of public assembly.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Northport, Tuscaloosa	All	Both	Action	Existing Funds
3.9.3	Distribute weather radios and emergency response instructions to municipal residents.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock,	All	Both	Action	FEMA HMA Grant
3.10	**Disaster Warning. Improve public warning systems.**					
3.10.1	Upgrade siren-warning systems to provide complete coverage to all jurisdictions.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	Flooding	Both	Project	FEMA HMA Grant
3.10.2	Upgrade critical communications infrastructure.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	Flooding	Both	Project	FEMA HMA Grant
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, flood plains, and wetlands to assure permanent protection of these natural resources.**					

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
4.1.1	Increase open space acquisitions through the FEMA HMA Grant Programs and other flood plain acquisition efforts.	Tuscaloosa County, Brookwood, Coker, Northport, Tuscaloosa	Flooding	Existing	Project	FEMA HMA Grant
4.2	**River/Stream Corridor Restoration and Protection. Restore and protect river and stream corridors within areas.**					
4.2.1	Keep builders and developers informed of Federal wetlands permitting requirements of the Corps of Engineers.	Tuscaloosa County, Brookwood, Coker, Northport, Tuscaloosa, Vance	Flooding	Both	Action	Existing Funds
4.2.2	Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.	Tuscaloosa County, Brookwood, Coker, Northport, Tuscaloosa	Flooding	Existing	Action	Existing Funds
4.3	**Urban Forestry Programs. Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wild fires within urban areas.**					
4.3.1	Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).	Tuscaloosa County, Brookwood, Coker, Northport, Tuscaloosa	Flooding	Existing	Action	Existing Funds
4.3.2	Increase overall green spaces in cities by planting hurricane resistant trees with site and location taken into consideration.	Brookwood, Coker,	Wildfire	Both	Action	TBD
4.3.3	Develop an urban forestry management plan to ensure a progressive urban forestry program aimed at increasing forestry canopy, increased safety and planting hurricane resistant tree species.	Tuscaloosa County, Brookwood, Coker,	Wildfire	Both	Action	TBD
4.5	**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.**					
4.5.1	Enforce water use restrictions during periods of drought to conserve existing water supplies.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Northport, Tuscaloosa	Droughts/heat waves, wildfires	Both	Action	Existing Funds

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
5	**Goal for Structural 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 Maintenance. Improve maintenance programs for streams and drainage ways.**					
5.1.1	Prepare and implement standard operating procedures and guidelines for drainage system maintenance.	Tuscaloosa County, Brookwood, Coker, Northport, Tuscaloosa,	Flooding	Both	Action	TBD
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 in identified problem drainage areas.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	Flooding	Both	Project	FEMA HMA Grant
5.2.2	Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.	Tuscaloosa County, Brookwood, Coker, Northport, Tuscaloosa	Drought	Both	Project	FEMA HMA Grant
5.3	**Community Shelters and Safe Rooms: Provide shelters from natural hazards for the safety of community residents.**					
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.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	Hurricanes, Tornadoes, Severe Storms	New	Project	FEMA HMA Grant
5.3.2	Establish a program for subsidizing individual and community safe room construction in appropriate locations and facilities.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	Hurricanes, Tornadoes, Severe Storms	Both	Project	FEMA HMA Grant

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
5.3.3	Encourage the construction of safe rooms in new and existing homes and buildings.	Tuscaloosa County, Brookwood, Coaling, Coker, Lake View, Moundville, Northport, Tuscaloosa, Vance, Woodstock	Hurricanes, Tornadoes, Severe Storms	Both	Project	FEMA HMA Grant

Chapter 7 – 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

This Chapter presents a more active monitoring and streamlined plan amendment process; revised guidance for annual evaluation of plan status; refined and updated process, ongoing integration of local planning mechanism, and new public participation opportunities to be continuously monitored and annually evaluated.

7.3 Monitoring, Evaluating, and Updating the Mitigation Plan

7.3.1 Ongoing Monitoring of the Plan

Up until its meeting on April 14, 2014, to kick off the five-year update process, the Hazard Mitigation Planning Committee's (HMPC) failed to maintain the 2009 mitigation plan over the five-year cycle. The HMPC now recognizes this deficiency and the need for ongoing plan maintenance to make the plan relevant and to comply with Federal requirements. To remediate this deficiency, the HMPC, following the adoption of this five-year plan, will perform plan maintenance, as set forth in this Chapter. The HMPC will conduct an ongoing review process throughout the year and continually monitor the current status of the mitigation measures scheduled for implementation. Ongoing status reports of each jurisdiction's progress will be reviewed by the Tuscaloosa County EMA Director and representatives from the HMPC and should include the following information:

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

The ongoing review process may require adjustments to the selection of mitigation measures, priorities, timelines, lead responsibilities, and funding sources scheduled in the "Community Action Programs." In the event modifications to the plan are warranted as a result of the annual review or other conditions, the HMPC will oversee and approve all amendments to the plan by majority vote of a quorum of HMPC members. Conditions that might warrant amendments to this plan would include, but not be limited to, special opportunities for funding and response to a natural or manmade disaster. A copy of the plan amendments will be submitted by the Tuscaloosa County EMA to all jurisdictions in a timely manner and filed with the Alabama EMA.

7.3.2 Evaluating the Plan

Within sixty days following a significant disaster or an emergency event having a substantial impact on a portion of or the entire Tuscaloosa County area or any of its jurisdictions, the HMPC will conduct or oversee an analysis of the event to evaluate the responsiveness of the Mitigation Strategy to the event and the effects on 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 findings of the assessment should determine any new mitigation initiatives that should be incorporated into this plan to avoid similar losses from future hazard events. The results of the assessment will be provided to those affected jurisdictions for review. These results also provide useful information when considering new mitigation initiatives as an amendment to the existing plan or during the next five-year plan update period.

The HMPC will oversee an annual evaluation of progress towards implementation of the Mitigation Strategy. Any discussions and reports by the HMPC should be documented. When the plan is next revised, the evaluation findings can clearly justify and explain any revisions. In its annual review, 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 the plan?
- Have any disasters occurred and are not included in plan?
- Are there additional mitigation ideas that need to be incorporated into the 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?

The HMPC may create subcommittees to oversee and evaluate plan implementation. This will be done at the Committee's discretion.

7.3.3 Plan Update Process

Any of the following situations may require a review and update of the plan:

- Requirement for a five-year update.
- Change in federal requirements for review and update of the plan.
- Significant natural hazard or manmade event(s) before the expiration of the five-year plan update.

As stated above in Section 7.3.2, the HMPC will convene within 60 days of a significant disaster to discuss the potential need for any amendments to the plan. If there are no significant disasters which trigger an update, the current Federal guidelines require a five-year update.

The Tuscaloosa County EMA will release or publish a notice to the public 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 then convene the HMPC and, with the assistance of EMA staff or a consultant, as deemed necessary, carry out the steps necessary to update the plan.

The initial steps for the five-year update to this plan should begin nine to twelve months before the current FEMA approval expiration, which takes into consideration the 90 day review process by the Alabama EMA and FEMA. Additional time for planning grants may require up to an additional year added to the start date. Once the Hazard Mitigation Planning Committee has been organized to oversee the update, the following steps will take place in order to facilitate the process:

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.
Step 5. Evaluation of existing plan maintenance procedures and recommendations for improvements.
Step 6. Comply with all applicable Federal regulations and directives.

Ninety days prior to the anniversary date, a final draft of the revised plan will be submitted 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 updated plan will be adopted by all participating jurisdictions.

7.4 Incorporation of the Mitigation Plan into Other Planning Mechanisms

This plan supplements the most recent edition of the Tuscaloosa County Emergency Operations Plan, which is administered through the Tuscaloosa County Emergency Management Agency. Further, each governmental entity will be responsible for implementation of their individual Community Mitigation Action Programs based on priorities, funding availability, capabilities, and other considerations described in Chapter 6 “Mitigation Strategy.” Because the 2014 Tuscaloosa County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan, the mechanisms for implementation of the various mitigation measures through existing programs may vary by jurisdiction. Each jurisdiction’s unique needs and capabilities for implementation are reflected in its respective mitigation action program.

The Hazard Mitigation Planning Committee recognizes the importance of fully integrating hazard mitigation planning and implementation into existing local plans, regulatory tools, and related programs. This plan is intended to influence each jurisdiction's planning decisions concerning land use, development, public facilities, and infrastructure. Any updates, revisions, or amendments to the Tuscaloosa 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. 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. This type of evaluation was performed in the 2014 update and should follow in the next update cycle.

Multi-hazard mitigation planning should not only be integrated with local planning tools but into existing public information activities, as well as household emergency preparedness. 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.

Of particular importance to incorporating hazard mitigation planning into other planning programs, is the Tuscaloosa County EMA's commitment to full integration of multi-hazard mitigation planning into its comprehensive emergency operations planning program and associated public emergency management activities, to the furthest possible extent.

7.5 Continuing Public Participation in the Plan Maintenance Process

A critical part of maintaining an effective and relevant multi-hazard mitigation plan is ongoing public review and comment. Consequently, the Hazard Mitigation Planning Committee is dedicated to direct involvement of its citizens in providing feedback and comments on the plan throughout the five-year implementation cycle and interim reviews. To this end, copies of this 2014 Tuscaloosa County Multi-Hazard Mitigation Plan will be maintained in the offices of the Tuscaloosa County EMA and the principal offices of all of the jurisdictions that participated in the planning process. After adoption, a public information notice will inform the public that the plan may be viewed at these offices or on the Web. The Tuscaloosa County EMA website at http://www.tclepc.com contains a link to download an on-line copy of the plan. Public comments can be received by the Tuscaloosa County EMA by telephone, mail, or e-mail.

Public meetings will be held when significant modifications to the plan are required or when otherwise deemed necessary by the Hazard Mitigation Planning Committee. The public will be able to express their concerns, ideas, and opinions at the meetings. At a minimum, public hearings will be held during the annual meetings and five-year plan updates and to present the final plan and amendments to the plan to the public before adoption. Public opinion surveys may be conducted during the community meetings and public involvement activities required for the five-year update and may be periodically administered by the Tuscaloosa County EMA.

Extensive public involvement activities initiated by the 2014 planning process are well documented in Appendix H - “Community Involvement Documentation.” Many of these activities will continue throughout the five-year implementation cycle and be evaluated for effectiveness at least annually by the Hazard Mitigation Planning Committee. Moreover, the public outreach goal of this plan and the associated objectives and mitigation measures commit each locality to implement a range of public education and awareness opportunities. The constant monitoring of these programmed mitigation actions assures ongoing public participation throughout the plan maintenance process.

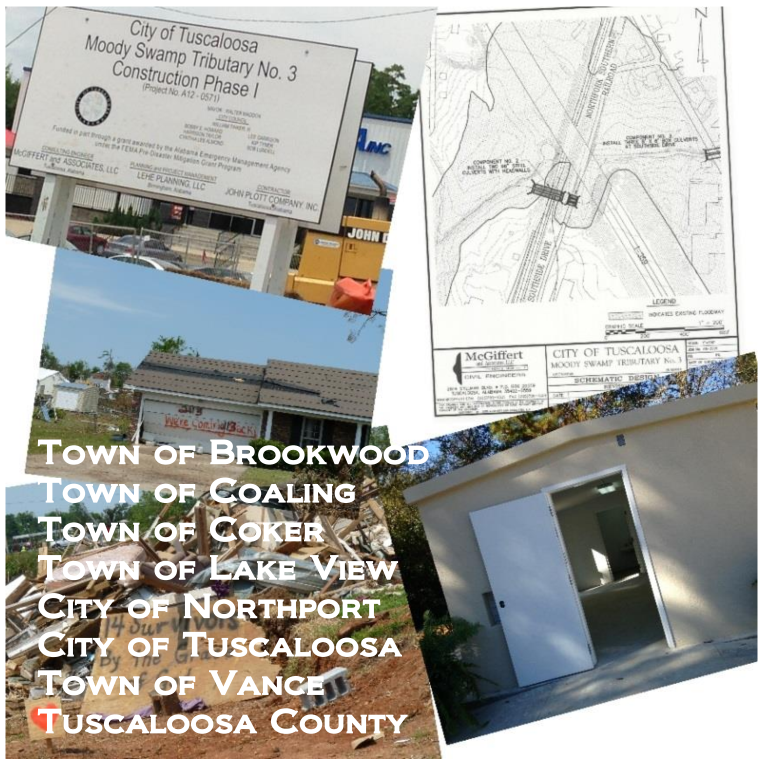
2014

Tuscaloosa County, Alabama

Multi-Hazard Mitigation Plan

II. Community Action Programs

A multi-jurisdiction plan



Prepared under the direction of the
Tuscaloosa County Hazard Mitigation Planning Committee

With the support of the Tuscaloosa County EMA by:

Lehe Planning LLC
URBAN AND ENVIRONMENTAL PLANNING

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February 25, 2015

2014 Tuscaloosa County, Alabama, Multi-Hazard Mitigation Plan

II. Community Action Programs

Town of Brookwood, Town of Coaling, Town of Coker, Town of Lake View, City of Northport, City of Tuscaloosa, Town of Vance, and Tuscaloosa County

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February 25, 2015

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Community Action Programs

Community Action Programs

1.0 Development of Community Action Programs

The Community Action Programs supplement Table 6-2 "2014-2019 Tuscaloosa County Multi-Jurisdictional Mitigation Action Program" is found in Chapter 6, Section 6.5. These Community Action Programs break out the same mitigation goals, objectives, and mitigation measures by community and add the priority, timeframe for completion, and lead responsibility for implementation.

In developing a list of mitigation measures for potential loss reduction, the planning team utilized three main sources: the 2009 Tuscaloosa County Hazard Mitigation Plan, the 2013 Alabama State Hazard Mitigation Plan, and the Hazard Mitigation Planning Committee. First, the planning team took the mitigation measures presented to the HMPC in 2009 and used them as base measures for the HMPC to consider for the plan update (see Appendix C "2009 Plan Implementation Status"). Second, the team added the action items that are listed in the 2013 Alabama State Hazard Mitigation Plan mitigation strategy, in which the State assigned implementation responsibility to local jurisdictions. Third, mitigation actions the HMPC developed through various exercises that were not covered by either the 2009 plan or the 2013 state plan were added to the list (see Appendix F "Alternative Mitigation Measures").

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. Mitigation measures that resulted in loss reduction to existing and new buildings and infrastructure were chosen for the final list of considered measures.

Each identified measure was entered into a table, which listed the hazard(s) addressed, the effects on new or existing buildings or infrastructure, whether the measure is an action or a project, if any project had the potential for FEMA HMA funding, and the origin or source of the measure. Each item was categorized with other measures that fulfilled common goals and objectives. The final comprehensive strategy is presented in Table 6-2 "2014-2019 Tuscaloosa County Multi-Jurisdictional Mitigation Action Program."

2.0 Community Action Programs for Each Jurisdiction

This section presents the Community Action Programs adopted by each of the participating jurisdictions. The following key explains the components of the Community Action Programs:

Key

- Action programs are in alphabetical order by jurisdiction.
- The action programs assign lead responsibility for implementation to a specific department or agency or position within the organization.
- 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 *Ongoing*.
- 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.
- *TBD* is "To Be Determined."

Tuscaloosa County Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	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 natural 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 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.	All	Medium	Mid-Range	County Commission	Action	TBD	TBD
1.1.2	Integrate the findings and recommendations of this plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	Medium	Mid-Range	County Commission	Action	TBD	TBD
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.	All	Medium	Mid-Range	County Commission	Action	TBD	TBD
1.2	**Geographic Information Systems (GIS). Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories.**							

Tuscaloosa County Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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, hurricane surge areas, tornado tracks, disaster events and their extents, and a comprehensive inventory of critical facilities within all jurisdictions.	All	Medium	Mid-Range	County Commission	Action	No Additional Cost	Existing Funds
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.	All	H-M-L	S-M-L	County Commission	Action	TBD	TBD
1.3	**<u>Planning Studies</u>. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
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.	All	Medium	Mid-Range	County Engineer	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	County Engineer	Action	No Additional Cost	Existing Funds
1.3.4	Inventory and map existing fire hydrants throughout the county, and identify areas in need of new fire hydrants.	Wildfires	Low	Long-Range	Fire Department	Action	No Additional Cost	Existing Funds
1.3.5	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	Flooding	Medium	Mid-Range	Mayor, Council and Planning Commission	Action	TBD	TBD

Tuscaloosa County Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.4	**<u>Zoning</u>. Establish effective zoning controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							
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.	Flooding	Medium	Mid-Range	County Engineer	Action	No Additional Cost	Existing Funds
1.5	**<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 parks, conservation areas, landscaping, and drainage.**							
1.5.1	Examine regulatory options and feasibility of requiring open space areas for recreation, landscaping, and drainage control.	Flooding	Low	Long-Range	County Engineer	Action	No Additional Cost	Existing Funds
1.6	**<u>Flood Plain Management Regulations.</u> Effectively administer and enforce local floodplain management regulations.**							
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.	Flooding	Medium	Mid-Range	County Commission	Action	No Additional Cost	Existing Funds
1.6.2	Maintain a library of technical assistance and guidance materials to support the local floodplain manager.	Flooding	Medium	Mid-Range	Floodplain Manager	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	County Commission	Action	No Additional Cost	Existing Funds

Tuscaloosa County Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.6.5	Participate in the "Turn Around Don't Drown" program by promoting the purchase and installation signs in known flash flood bridge overpass locations.	Flooding	Medium	Mid-Range	County Commission	Project	No Additional Cost	Existing Funds
1.9	**<u>Storm Water Management.</u> Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**							
1.9.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	Flooding	Medium	Long-Range	County Commission	Action	No Additional Cost	Existing Funds
1.9.2	Develop, adopt and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Flooding	Low	Long-Range	County Commission	Action	No Additional Cost	Existing Funds
1.10	**<u>Dam Safety Management.</u> Establish a comprehensive dam safety program.**							
1.10.1	Support legislation to establish a State dam safety program.	Dam/Levee Failure	Low	Long-Range	County Commission	Action	No Additional Cost	Existing Funds
1.11	**<u>Community Rating System Program (CRS).</u> Increase participation of NFIP member communities in the CRS Program.**							
1.11.1	Apply for/maintain membership in the CRS Program; continue to upgrade rating.	Flooding	Medium	Short-Range	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.12	**<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 disaster events.**							

Tuscaloosa County Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.12.1	Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	High	Mid-Range	TBD	Action	TBD	TBD
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.	Wildfire	Low	Long-Range	Fire Department	Project	No Additional Cost	Existing Funds
2	**Goal for Property Protection: Protect structures and their occupants and contents from the damaging effects of natural 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	Ongoing	County Engineer	Project	TBD	FEMA HMA Grant
2.2	**Acquisition. Acquire flood prone buildings and properties and establish permanent open space.**							
2.2.1	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	Flooding	Medium	Ongoing	County Engineer	Project	TBD	FEMA HMA Grant
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.	Flooding	Medium	Ongoing	County Engineer	Project	TBD	FEMA HMA Grant

Tuscaloosa County Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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; where feasible, elevation is preferable to flood proofing.	Flooding	Medium	Ongoing	County Engineer	Project	TBD	FEMA HMA Grant
2.3.2	Repair, elevate and weatherize existing homes for low- to moderate-income families.	Flooding	Medium	Ongoing	County Engineer	Project	TBD	FEMA HMA Grant
2.4	**<u>Flood Proofing.</u> Encourage flood proofing of buildings in hazardous flood areas to safeguard against damages.**							
2.4.1	Flood proof pre-FIRM non-residential buildings, where feasible.	Flooding	Medium	Ongoing	County Engineer	Project	TBD	FEMA HMA Grant
2.4.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	Flooding	Medium	Ongoing	County Engineer	Project	TBD	FEMA HMA Grant
2.5	**<u>Building Retrofits</u>. Retrofit vulnerable buildings to protect against natural hazards damages, including flooding, high winds, tornadoes, hurricanes, severe storms, and earthquakes.**							
2.5.1	Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Mid-Range	County Engineer	Action	TBD	FEMA HMA Grant

Tuscaloosa County Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.5.2	Provide technical advisory assistance to building owners on available building retrofits to protect against natural hazards damages.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Ongoing	County Engineer	Action	TBD	FEMA HMA Grant
2.6	**<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.**							
2.6.1	Promote the purchase of insurance coverage by property owners and renters for flood damages in high-risk areas.	All	Medium	Ongoing	County Commission	Action	No Additional Cost	Existing Funds
2.7	**<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 or construction of new facilities for maximum protection from all hazards.**							
2.7.1	Install lightning and/or surge protection on existing critical facilities.	Severe storms	High	Ongoing	County Engineer	Project	TBD	TBD
2.7.2	Conduct ongoing tree trimming programs along power lines.	Severe storms	High	Ongoing	TBD	Action	TBD	TBD
2.8	**<u>Back Up Power:</u> Assure uninterrupted power supplies during emergency events.**							
2.8.1	Install backup power generators for critical facilities.	Hurricanes, Tornadoes, Severe Storms	Medium	Ongoing	County Commission	Project	TBD	FEMA HMA Grant
3	**<u>Goal for Public Education and Outreach</u>. Educate and inform the public about the risks of hazards and the techniques available to reduce threats to life and property.**							

Tuscaloosa County Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.2	**<u>Outreach Projects.</u> Conduct regular public events to inform the public of hazards and mitigation measures.**							
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.	All	High	Ongoing	County Commission	Action	No Additional Cost	Existing Funds
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.	All	High	Ongoing	County Commission	Action	No Additional Cost	Existing Funds
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.	All	High	Ongoing	County Commission	Action	No Additional Cost	Existing Funds
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.	Flooding	High	Ongoing	County Commission	Action	No Additional Cost	Existing Funds
3.2.5	Educate citizens on water saving techniques.	Drought	High	Ongoing	County Commission	Action	No Additional Cost	Existing Funds
3.2.6	Educate farmers on soil and water conservation practices.	Drought	High	Ongoing	County Commission	Action	No Additional Cost	Existing Funds
3.5	**<u>Education Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							

Tuscaloosa County Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.5.2	Educate homeowners about structural and non-structural retrofitting of vulnerable homes.	Earthquake	Medium	Ongoing	County Commission	Action	No Additional Cost	Existing Funds
3.6	**<u>Community Hazard Mitigation Plan Distribution</u>. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.6.1	Distribute the 2014 plan to local officials, stakeholders, and interested individuals through internet download.	All	Medium	Ongoing	County Commission	Action	No Additional Cost	Existing Funds
3.7	**<u>Technical Assistance</u>. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**							
3.7.1	Provide technical assistance to homeowners, builders, and developers on flood protection alternatives.	Flooding	Low	Ongoing	Floodplain Manager	Action	No Additional Cost	Existing Funds
3.8	**<u>Mass Media Relations</u>. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, and on-line social networking to increase public awareness and distribute public information on hazard mitigation topics.**							
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.	All	Medium	Ongoing	County Commission	Action	No Additional Cost	Existing Funds
3.9	**<u>Weather Radios</u>. Improve public access to weather alerts.**							
3.9.1	Promote the use of weather radios in households and businesses.	All	Medium	Ongoing	County Commission	Action	No Additional Cost	Existing Funds

Tuscaloosa County Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.9.2	Encourage the installation of weather radios in all public buildings and places of public assembly.	All	High	Short-Range	County Commission	Action	No Additional Cost	Existing Funds
3.9.3	Distribute weather radios and emergency response instructions to municipal residents.	All	Medium	Mid-Range	County Commission	Action	TBD	FEMA HMA Grant
3.10	**<u>Disaster Warning.</u> Improve public warning systems.**							
3.10.1	Upgrade siren-warning systems to provide complete coverage to all jurisdictions.	Flooding	Medium	Ongoing	County Commission	Project	TBD	FEMA HMA Grant
3.10.2	Upgrade critical communications infrastructure.	Flooding	Medium	Mid-Range	County Commission	Project	TBD	FEMA HMA Grant
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.**							
4.1	**<u>Open Space Easements and Acquisitions.</u> Acquire easements and fee-simple ownership of environmentally beneficial lands, such as hillsides, flood plains, 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 flood plain acquisition efforts.	Flooding	Medium	Mid-Range	County Commission	Project	TBD	FEMA HMA Grant
4.2	**<u>River/Stream Corridor Restoration and Protection.</u> Restore and protect river and stream corridors within areas.**							
4.2.2	Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.	Flooding	Medium	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds

Tuscaloosa County Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
4.3	**<u>Urban Forestry Programs.</u> Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wild fires within urban areas.**							
4.3.1	Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).	Flooding	Low	Long-Range	County Commission	Action	No Additional Cost	Existing Funds
5	**<u>Goal for Structural 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 Maintenance.</u> Improve maintenance programs for streams and drainage ways.**							
5.1.1	Prepare and implement standard operating procedures and guidelines for drainage system maintenance.	Flooding	Medium	Ongoing	County Engineer	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 in identified problem drainage areas.	Flooding	Medium	Mid-Range	County Commission	Project	TBD	FEMA HMA Grant
5.2.2	Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.	Drought	Low	Mid-Range	County Commission	Project	TBD	FEMA HMA Grant
5.3	**<u>Community Shelters and Safe Rooms</u>: Provide shelters from natural hazards for the safety of community residents.**							

Tuscaloosa County Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	County Commission	Project	TBD	FEMA HMA Grant
5.3.2	Establish a program for subsidizing individual and community safe room construction in appropriate locations and facilities.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	County Commission	Project	TBD	FEMA HMA Grant
5.3.3	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	County Commission	Project	No Additional Cost	Existing Funds

Town of Brookwood Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	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 natural 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 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.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
1.1.2	Integrate the findings and recommendations of this plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD

Town of Brookwood Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
1.3	**<u>Planning Studies</u>. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
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.	Flooding	Low	Long-Range	Mayor and Council	Action	TBD	TBD
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.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.3.4	Inventory and map existing fire hydrants throughout the county, and identify areas in need of new fire hydrants.	Wildfires	Low	Long-Range	Fire Department	Action	No Additional Cost	Existing Funds
1.3.5	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	Flooding	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
1.4	**<u>Zoning</u>. Establish effective zoning controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							

Town of Brookwood Community Action Program

Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.4.1	Consider large lot size restrictions on flood prone areas designated on Flood Insurance Rate Maps.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.4.4	Enact local ordinance that require community storm shelters within sizeable mobile home parks and subdivisions.	Tornadoes, Hurricanes, Severe Storms	High	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.5	**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 parks, conservation areas, landscaping, and drainage.**							
1.5.1	Examine regulatory options and feasibility of requiring open space areas for recreation, landscaping, and drainage control.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.6	**Flood Plain Management Regulations. Effectively administer and enforce local floodplain management regulations.**							
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Brookwood Community Action Program

Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.6.2	Maintain a library of technical assistance and guidance materials to support the local Mayor and Council.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.6.5	Participate in the “Turn Around Don’t Drown” program by purchasing and installing signs in known flash flood bridge overpass locations.	Flooding	Medium	Mid-Range	Mayor and Council	Project	No Additional Cost	Existing Funds
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.	Flooding	Medium	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds
1.7	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from natural hazard damages.**							
1.7.1	Promote good construction practices and proper code enforcement to mitigate structural failures during natural hazard events.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Brookwood Community Action Program									
Goal, Objectives and Mitigation Measures		**Hazards Addressed**	**Priority**	**Timeline**	**Lead Responsibility for Carrying Out Measure**	**Action or Project**	**Estimated Cost**	**Funding Source**
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."	Tornadoes, Hurricanes, Severe Storms	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Tornadoes, severe storms, winter storms/freezes, hurricanes	Low	Ongoing	Mayor and Council	Action	TBD	TBD
1.7.4	Ensure fire safety ordinances properly regulate open burning, the use of liquid fuel and electric space heaters.	Wildfires	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
1.7.5	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Tornadoes, Hurricanes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds
1.8	**Landscape Ordinances. Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff and improve urban aesthetics.**							
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.	Wildfires	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Brookwood Community Action Program

Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Wildfires	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.9	**Storm Water Management. Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**							
1.9.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	Flooding	Medium	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.9.2	Develop, adopt and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.11	**Community Rating System Program (CRS). Increase participation of NFIP member communities in the CRS Program.**							
1.11.1	Apply for/maintain membership in the CRS Program; continue to upgrade rating.	Flooding	Medium	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.12	**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 disaster events.**							
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.	Wildfire	Low	Long-Range	Fire Department	Project	No Additional Cost	Existing Funds
2	**Goal for Property Protection: Protect structures and their occupants and contents from the damaging effects of natural hazards.**							

Town of Brookwood Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
2.2	**Acquisition.** **Acquire flood prone buildings and properties and establish permanent open space.**							
2.2.1	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
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.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
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; where feasible, elevation is preferable to flood proofing.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
2.4	**Flood Proofing.** **Encourage flood proofing of buildings in hazardous flood areas to safeguard against damages.**							

Town of Brookwood Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.4.1	Flood proof pre-FIRM non-residential buildings, where feasible.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
2.4.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
2.5	**<u>Building Retrofits</u>. Retrofit vulnerable buildings to protect against natural hazards damages, including flooding, high winds, tornadoes, hurricanes, severe storms, and earthquakes.**							
2.5.1	Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Mid-Range	Mayor and Council	Action	TBD	FEMA HMA Grant
2.5.2	Provide technical advisory assistance to building owners on available building retrofits to protect against natural hazards damages.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Ongoing	Mayor and Council	Action	TBD	FEMA HMA Grant
2.6	**<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.**							
2.6.1	Promote the purchase of insurance coverage by property owners and renters for flood damages in high-risk areas.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Brookwood Community Action Program

Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.7	**<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 or construction of new facilities for maximum protection from all hazards.**							
2.7.1	Install lightning and/or surge protection on existing critical facilities.	Severe storms	High	Ongoing	Mayor and Council	Project	TBD	TBD
2.7.2	Conduct ongoing tree trimming programs along power lines.	Severe storms	High	Ongoing	TBD	Action	TBD	TBD
2.8	**<u>Back Up Power:</u> Assure uninterrupted power supplies during emergency events.**							
2.8.1	Install backup power generators for critical facilities.	Hurricanes, Tornadoes, Severe Storms	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
3	**<u>Goal for Public Education and Outreach</u>. Educate and inform the public about the risks of hazards and the techniques available to reduce threats to life and property.**							
3.1	**<u>Map Information.</u> Increase public access to Flood Insurance Rate Map (FIRM) information.**							
3.1.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications and newspaper announcements.	All	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
3.5	**<u>Education Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.5.1	Distribute hazard mitigation brochures to students through area schools.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Brookwood Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.6	**<u>Community Hazard Mitigation Plan Distribution</u>. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.6.1	Distribute the 2014 plan to local officials, stakeholders, and interested individuals through internet download.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.7	**<u>Technical Assistance</u>. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**							
3.7.1	Provide technical assistance to homeowners, builders, and developers on flood protection alternatives.	Flooding	Low	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.8	**<u>Mass Media Relations</u>. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, and on-line social networking to increase public awareness and distribute public information on hazard mitigation topics.**							
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.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9	**<u>Weather Radios</u>. Improve public access to weather alerts.**							
3.9.1	Promote the use of weather radios in households and businesses.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9.2	Require the installation of weather radios in all public buildings and places of public assembly.	All	High	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Brookwood Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.9.3	Distribute weather radios and emergency response instructions to municipal residents.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	FEMA HMA Grant
3.10	**<u>Disaster Warning.</u> Improve public warning systems.**							
3.10.1	Upgrade siren-warning systems to provide complete coverage to all jurisdictions.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
3.10.2	Upgrade critical communications infrastructure.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
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.**							
4.1	**<u>Open Space Easements and Acquisitions.</u> Acquire easements and fee-simple ownership of environmentally beneficial lands, such as hillsides, flood plains, 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 flood plain acquisition efforts.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
4.2	**<u>River/Stream Corridor Restoration and Protection.</u> Restore and protect river and stream corridors within areas.**							
4.2.1	Keep builders and developers informed of Federal wetlands permitting requirements of the Corps of Engineers.	Flooding	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Brookwood Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
4.2.2	Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.	Flooding	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
4.3	**<u>Urban Forestry Programs.</u> Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wild fires within urban areas.**							
4.3.1	Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
4.3.2	Increase overall green spaces in cities by planting hurricane resistant trees with site and location taken into consideration.	Wildfire	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
4.5	**<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.**							
4.5.1	Enforce water use restrictions during periods of drought to conserve existing water supplies.	Droughts/heat waves, wildfires	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
5	**<u>Goal for Structural 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 Maintenance.</u> Improve maintenance programs for streams and drainage ways.**							
5.1.1	Prepare and implement standard operating procedures and guidelines for drainage system maintenance.	Flooding	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Brookwood Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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 in identified problem drainage areas.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
5.2.2	Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.	Drought	Low	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3	**Community Shelters and Safe Rooms**: **Provide shelters from natural hazards for the safety of community residents.**							
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.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.2	Establish a program for subsidizing individual and community safe room construction in appropriate locations and facilities.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.3	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds

Town of Coaling Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	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 natural 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 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.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
1.1.2	Integrate the findings and recommendations of this plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
1.4	**Zoning. Establish effective zoning controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							

Town of Coaling Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.4.4	Enact local ordinance that require community storm shelters within sizeable mobile home parks and subdivisions.	Tornadoes, Hurricanes, Severe Storms	High	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.7	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from natural hazard damages.**							
1.7.1	Promote good construction practices and proper code enforcement to mitigate structural failures during natural hazard events.	All	Medium	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
1.7.4	Ensure fire safety ordinances properly regulate open burning, the use of liquid fuel and electric space heaters.	Wildfires	Medium	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
1.7.5	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	All	Medium	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
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.	Tornadoes, Hurricanes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds
1.12	**<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 disaster events.**							
1.12.1	Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	High	Mid-Range	Mayor and Council	Action	TBD	TBD
2								

Town of Coaling Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
	Goal for Property Protection: Protect structures and their occupants and contents from the damaging effects of natural 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	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.2	**Acquisition. Acquire flood prone buildings and properties and establish permanent open space.**							
2.2.1	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	Flooding	Medium	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
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.	Flooding	Medium	Ongoing	Building Inspector, Floodplain Manager	Project	TBD	FEMA HMA Grant
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; where feasible, elevation is preferable to flood proofing.	Flooding	Medium	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.3.2	Repair, elevate and weatherize existing homes for low- to moderate-income families.	Flooding	Medium	Ongoing	Building Inspector	Project	TBD	FEMA HMA Grant
2.4								

Town of Coaling Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
	<u>Flood Proofing.</u> Encourage flood proofing of buildings in hazardous flood areas to safeguard against damages.							
2.4.1	Flood proof pre-FIRM non-residential buildings, where feasible.	Flooding	Medium	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.4.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	Flooding	Medium	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.5	**<u>Building Retrofits</u>. Retrofit vulnerable buildings to protect against natural hazards damages, including flooding, high winds, tornadoes, hurricanes, severe storms, and earthquakes.**							
2.5.1	Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Mid-Range	Mayor and Council, Building Inspector	Action	TBD	FEMA HMA Grant
2.5.2	Provide technical advisory assistance to building owners on available building retrofits to protect against natural hazards damages.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Ongoing	Building Inspector	Action	TBD	FEMA HMA Grant
2.6	**<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.**							

Town of Coaling Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.6.1	Promote the purchase of insurance coverage by property owners and renters for flood damages in high-risk areas.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
2.7	**<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 or construction of new facilities for maximum protection from all hazards.**							
2.7.1	Install lightning and/or surge protection on existing critical facilities.	Severe storms	High	Ongoing	Mayor and Council	Project	TBD	TBD
2.7.2	Conduct ongoing tree trimming programs along power lines.	Severe storms	High	Ongoing	TBD	Action	TBD	TBD
2.8	**<u>Back Up Power:</u> Assure uninterrupted power supplies during emergency events.**							
2.8.1	Install backup power generators for critical facilities.	Hurricanes, Tornadoes, Severe Storms	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
3	**<u>Goal for Public Education and Outreach</u>. Educate and inform the public about the risks of hazards and the techniques available to reduce threats to life and property.**							
3.2	**<u>Outreach Projects.</u> Conduct regular public events to inform the public of hazards and mitigation measures.**							
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.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Coaling Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.2.5	Educate citizens on water saving techniques.	Drought	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.5	**<u>Education Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.5.1	Distribute hazard mitigation brochures to students through area schools.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.5.2	Educate homeowners about structural and non-structural retrofitting of vulnerable homes.	Earthquake	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.6	**<u>Community Hazard Mitigation Plan Distribution</u>. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.6.1	Distribute the 2014 plan to local officials, stakeholders, and interested individuals through internet download.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9	**<u>Weather Radios</u>. Improve public access to weather alerts.**							
3.9.1	Promote the use of weather radios in households and businesses.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9.2	Require the installation of weather radios in all public buildings and places of public assembly.	All	High	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Coaling Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.10	**<u>Disaster Warning.</u> Improve public warning systems.**							
3.10.1	Upgrade siren-warning systems to provide complete coverage to all jurisdictions.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
3.10.2	Upgrade critical communications infrastructure.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
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.**							
4.1	**<u>Open Space Easements and Acquisitions.</u> Acquire easements and fee-simple ownership of environmentally beneficial lands, such as hillsides, flood plains, 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 flood plain acquisition efforts.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
4.5	**<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.**							
4.5.1	Enforce water use restrictions during periods of drought to conserve existing water supplies.	Droughts/heat waves, wildfires	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Coaling Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
5	**Goal for Structural 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.**							
5.2	**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 in identified problem drainage areas.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
5.2.2	Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.	Drought	Low	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3	**Community Shelters and Safe Rooms: Provide shelters from natural hazards for the safety of community residents.**							
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.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.2	Establish a program for subsidizing individual and community safe room construction in appropriate locations and facilities.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.3	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1	**<u>Goal for Prevention.</u> Manage the development of land and buildings to minimize risks of loss due to natural hazards.**							
1.1	**<u>Comprehensive Plans and Smart Growth</u>. 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 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.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
1.1.2	Integrate the findings and recommendations of this plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
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.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
1.2	**<u>Geographic Information Systems (GIS)</u>. Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories.**							

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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, hurricane surge areas, tornado tracks, disaster events and their extents, and a comprehensive inventory of critical facilities within all jurisdictions.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	All	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.2.3	Mark depths of flooding and storm surge immediately after each event. Enter and maintain these historical records in GIS.	Flooding	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
1.3	**Planning Studies. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
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.	Flooding	Low	Long-Range	Mayor and Council	Action	TBD	TBD
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.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.3.4	Inventory and map existing fire hydrants throughout the county, and identify areas in need of new fire hydrants.	Wildfires	Low	Long-Range	Fire Department	Action	No Additional Cost	Existing Funds
1.3.5	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	Flooding	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
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.	Earthquake	Low	Long-Range	Mayor and Council	Project	TBD	TBD
1.4	**Zoning. Establish effective zoning controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							
1.4.1	Consider large lot size restrictions on flood prone areas designated on Flood Insurance Rate Maps.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.4.4	Enact local ordinance that require community storm shelters within sizeable mobile home parks and subdivisions.	Tornadoes, Hurricanes, Severe Storms	High	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.5	**<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 parks, conservation areas, landscaping, and drainage.**							
1.5.1	Examine regulatory options and feasibility of requiring open space areas for recreation, landscaping, and drainage control.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.6	**<u>Flood Plain Management Regulations.</u> Effectively administer and enforce local floodplain management regulations.**							
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.6.2	Maintain a library of technical assistance and guidance materials to support the local floodplain manager.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.6.5	Participate in the "Turn Around Don't Drown" program by purchasing and installing signs in known flash flood bridge overpass locations.	Flooding	Medium	Mid-Range	Mayor and Council	Project	No Additional Cost	Existing Funds

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Flooding	Medium	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds
1.7	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from natural hazard damages.**							
1.7.1	Promote good construction practices and proper code enforcement to mitigate structural failures during natural hazard events.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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."	Tornadoes, Hurricanes, Severe Storms	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Tornadoes, severe storms, winter storms/freezes, hurricanes	Low	Ongoing	Mayor and Council	Action	TBD	TBD
1.7.4	Ensure fire safety ordinances properly regulate open burning, the use of liquid fuel and electric space heaters.	Wildfires	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
1.7.5	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Tornadoes, Hurricanes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds
1.8	**<u>Landscape Ordinances.</u> Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff and improve urban aesthetics.**							
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Wildfires	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Wildfires	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.9	**<u>Storm Water Management.</u> Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**							
1.9.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	Flooding	Medium	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.9.2	Develop, adopt and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.9.3	Establish urban forestry program to help mitigate storm water runoff common in areas with large impervious surfaces.	Flooding	Low	Long-Range	Mayor and Council	Action	TBD	TBD
1.11	**Community Rating System Program (CRS).** **Increase participation of NFIP member communities in the CRS Program.**							
1.11.1	Apply for/maintain membership in the CRS Program; continue to upgrade rating.	Flooding	Medium	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.12	**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 disaster events.**							
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.	Wildfire	Low	Long-Range	Fire Department	Project	No Additional Cost	Existing Funds
2	**Goal for Property Protection:** **Protect structures and their occupants and contents from the damaging effects of natural 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	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant

Town of Coker Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.2	**<u>Acquisition.</u> Acquire flood prone buildings and properties and establish permanent open space.**							
2.2.1	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
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.	Flooding	Medium	Ongoing	Mayor and Council	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; where feasible, elevation is preferable to flood proofing.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
2.3.2	Repair, elevate and weatherize existing homes for low- to moderate-income families.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
2.4	**<u>Flood Proofing.</u> Encourage flood proofing of buildings in hazardous flood areas to safeguard against damages.**							
2.4.1	Flood proof pre-FIRM non-residential buildings, where feasible.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
2.4.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.5	**<u>Building Retrofits</u>. Retrofit vulnerable buildings to protect against natural hazards damages, including flooding, high winds, tornadoes, hurricanes, severe storms, and earthquakes.**							
2.5.1	Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Mid-Range	Mayor and Council	Action	TBD	FEMA HMA Grant
2.5.2	Provide technical advisory assistance to building owners on available building retrofits to protect against natural hazards damages.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Ongoing	Mayor and Council	Action	TBD	FEMA HMA Grant
2.6	**<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.**							
2.6.1	Promote the purchase of insurance coverage by property owners and renters for flood damages in high-risk areas.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
2.6.2	Promote the purchase of crop insurance to cover potential losses due to drought.	Drought	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
2.7	**<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 or construction of new facilities for maximum protection from all hazards.**							
2.7.1	Install lightning and/or surge protection on existing critical facilities.	Severe storms	High	Ongoing	Mayor and Council	Project	TBD	TBD

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.7.2	Conduct ongoing tree trimming programs along power lines.	Severe storms	High	Ongoing	TBD	Action	TBD	TBD
2.8	**<u>Back Up Power:</u> Assure uninterrupted power supplies during emergency events.**							
2.8.1	Install backup power generators for critical facilities.	Hurricanes, Tornadoes, Severe Storms	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
3	**<u>Goal for Public Education and Outreach</u>. Educate and inform the public about the risks of hazards and the techniques available to reduce threats to life and property.**							
3.1	**<u>Map Information.</u> Increase public access to Flood Insurance Rate Map (FIRM) information.**							
3.1.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications and newspaper announcements.	All	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
3.2	**<u>Outreach Projects.</u> Conduct regular public events to inform the public of hazards and mitigation measures.**							
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.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.2.5	Educate citizens on water saving techniques.	Drought	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.2.6	Educate farmers on soil and water conservation practices.	Drought	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.3	**Real Estate Disclosure. Encourage real estate agents to disclose flood plain location for property listings.**							
3.3.1	Arrange with the Multiple Listing Service (MLS) to require floodplain location disclosure as a condition for each real estate listing.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.4	**<u>Library.</u> Use local library resources to educate the public on hazard risks and mitigation alternatives.**							
3.4.1	Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.5	**<u>Education Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.5.1	Distribute hazard mitigation brochures to students through area schools.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.5.2	Educate homeowners about structural and non-structural retrofitting of vulnerable homes.	Earthquake	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.6	**<u>Community Hazard Mitigation Plan Distribution</u>. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.6.1	Distribute the 2014 plan to local officials, stakeholders, and interested individuals through internet download.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.7	**<u>Technical Assistance</u>. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**							
3.7.1	Provide technical assistance to homeowners, builders, and developers on flood protection alternatives.	Flooding	Low	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.8	**<u>Mass Media Relations</u>. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, and on-line social networking to increase public awareness and distribute public information on hazard mitigation topics**							
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.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9	**<u>Weather Radios</u>. Improve public access to weather alerts.**							
3.9.1	Promote the use of weather radios in households and businesses.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9.2	Require the installation of weather radios in all public buildings and places of public assembly.	All	High	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9.3	Distribute weather radios and emergency response instructions to municipal residents.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	FEMA HMA Grant
3.10	**<u>Disaster Warning.</u> Improve public warning systems.**							
3.10.1	Upgrade siren-warning systems to provide complete coverage to all jurisdictions.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
3.10.2	Upgrade critical communications infrastructure.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant

Town of Coker Community Action Program

Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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, flood plains, 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 flood plain acquisition efforts.	Flooding	Medium	Mid-Range	Mayor and Council	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	Keep builders and developers informed of Federal wetlands permitting requirements of the Corps of Engineers.	Flooding	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
4.2.2	Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.	Flooding	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
4.3	**Urban Forestry Programs.** Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wild fires within urban areas.							
4.3.1	Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
4.3.2	Increase overall green spaces in cities by planting hurricane resistant trees with site and location taken into consideration.	Wildfire	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
4.5	**<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.**							
4.5.1	Enforce water use restrictions during periods of drought to conserve existing water supplies.	Droughts/heat waves, wildfires	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
5	**<u>Goal for Structural 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 Maintenance.</u> Improve maintenance programs for streams and drainage ways.**							
5.1.1	Prepare and implement standard operating procedures and guidelines for drainage system maintenance.	Flooding	Medium	Ongoing	Mayor and Council	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 in identified problem drainage areas.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant

Town of Coker Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
5.2.2	Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.	Drought	Low	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3	**<u>Community Shelters and Safe Rooms</u>: Provide shelters from natural hazards for the safety of community residents.**							
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.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.2	Establish a program for subsidizing individual and community safe room construction in appropriate locations and facilities.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.3	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds

Town of Lake View Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	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 natural 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 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.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.1.2	Integrate the findings and recommendations of this plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.2	**Geographic Information Systems (GIS).** Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories.							

Town of Lake View Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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, hurricane surge areas, tornado tracks, disaster events and their extents, and a comprehensive inventory of critical facilities within all jurisdictions.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	All	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.2.3	Mark depths of flooding and storm surge immediately after each event. Enter and maintain these historical records in GIS.	Flooding	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
1.3	**<u>Planning Studies</u>. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
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.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Lake View Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.3.4	Inventory and map existing fire hydrants throughout the county, and identify areas in need of new fire hydrants.	Wildfires	Low	Long-Range	Fire Department	Action	No Additional Cost	Existing Funds
1.3.5	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	Flooding	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
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.	Earthquake	Low	Long-Range	Mayor and Council	Project	TBD	TBD
1.4	**Zoning. Establish effective zoning controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							
1.4.1	Consider large lot size restrictions on flood prone areas designated on Flood Insurance Rate Maps.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.4.4	Enact local ordinance that require community storm shelters within sizeable mobile home parks and subdivisions.	Tornadoes, Hurricanes, Severe Storms	High	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Lake View Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.5	**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 parks, conservation areas, landscaping, and drainage.**							
1.5.1	Examine regulatory options and feasibility of requiring open space areas for recreation, landscaping, and drainage control.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.6	**Flood Plain Management Regulations. Effectively administer and enforce local floodplain management regulations.**							
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.6.2	Maintain a library of technical assistance and guidance materials to support the local Mayor and Council.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Lake View Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.6.5	Participate in the "Turn Around Don't Drown" program by purchasing and installing signs in known flash flood bridge overpass locations.	Flooding	Medium	Mid-Range	Mayor and Council	Project	No Additional Cost	Existing Funds
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.	Flooding	Medium	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds
1.7	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from natural hazard damages.**							
1.7.1	Promote good construction practices and proper code enforcement to mitigate structural failures during natural hazard events.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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."	Tornadoes, Hurricanes, Severe Storms	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Tornadoes, severe storms, winter storms/freezes, hurricanes	Low	Ongoing	Mayor and Council	Action	TBD	TBD
1.7.4	Ensure fire safety ordinances properly regulate open burning, the use of liquid fuel and electric space heaters.	Wildfires	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Lake View Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.7.5	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Tornadoes, Hurricanes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds
1.8	**Landscape Ordinances. Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff and improve urban aesthetics.**							
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.9	**Storm Water Management. Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**							
1.9.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	Flooding	Medium	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.9.2	Develop, adopt and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.10	**Dam Safety Management. Establish a comprehensive dam safety program.**							
1.10.1	Support legislation to establish a State dam safety program.	Dam/Levee Failure	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.11	**Community Rating System Program (CRS). Increase participation of NFIP member communities in the CRS Program.**							

Town of Lake View Community Action Program

Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.11.1	Apply for/maintain membership in the CRS Program; continue to upgrade rating.	Flooding	Medium	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.12	**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 disaster events.**							
1.12.1	Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	High	Mid-Range	TBD	Action	TBD	TBD
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.	Wildfire	Low	Long-Range	Fire Department	Project	No Additional Cost	Existing Funds
2	**Goal for Property Protection: Protect structures and their occupants and contents from the damaging effects of natural 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	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
2.2	**Acquisition. Acquire flood prone buildings and properties and establish permanent open space.**							

Town of Lake View Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.2.1	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
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.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
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; where feasible, elevation is preferable to flood proofing.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
2.3.2	Repair, elevate and weatherize existing homes for low- to moderate-income families.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
2.4	**Flood Proofing.** **Encourage flood proofing of buildings in hazardous flood areas to safeguard against damages.**							
2.4.1	Flood proof pre-FIRM non-residential buildings, where feasible.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
2.4.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant

Town of Lake View Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.5	**<u>Building Retrofits</u>. Retrofit vulnerable buildings to protect against natural hazards damages, including flooding, high winds, tornadoes, hurricanes, severe storms, and earthquakes.**							
2.5.1	Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Mid-Range	Mayor and Council	Action	TBD	FEMA HMA Grant
2.6	**<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.**							
2.6.1	Promote the purchase of insurance coverage by property owners and renters for flood damages in high-risk areas.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
2.6.2	Promote the purchase of crop insurance to cover potential losses due to drought.	Drought	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
2.7	**<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 or construction of new facilities for maximum protection from all hazards.**							
2.7.1	Install lightning and/or surge protection on existing critical facilities.	Severe storms	High	Ongoing	Mayor and Council	Project	TBD	TBD
2.8	**<u>Back Up Power:</u> Assure uninterrupted power supplies during emergency events.**							
2.8.1	Install backup power generators for critical facilities.	Hurricanes, Tornadoes, Severe Storms	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant

Town of Lake View Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3	**Goal for Public Education and Outreach.** Educate and inform the public about the risks of hazards and the techniques available to reduce threats to life and property.							
3.2	**Outreach Projects. Conduct regular public events to inform the public of hazards and mitigation measures.**							
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.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.3	**Real Estate Disclosure. Encourage real estate agents to disclose flood plain location for property listings.**							
3.3.1	Arrange with the Multiple Listing Service (MLS) to require floodplain location disclosure as a condition for each real estate listing.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
3.4	**Library. Use local library resources to educate the public on hazard risks and mitigation alternatives.**							
3.4.1	Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Lake View Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.5	**<u>Education Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.5.1	Distribute hazard mitigation brochures to students through area schools.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.6	**<u>Community Hazard Mitigation Plan Distribution</u>. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.6.1	Distribute the 2014 plan to local officials, stakeholders, and interested individuals through internet download.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.7	**<u>Technical Assistance</u>. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**							
3.7.1	Provide technical assistance to homeowners, builders, and developers on flood protection alternatives.	Flooding	Low	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.8	**<u>Mass Media Relations</u>. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, and on-line social networking to increase public awareness and distribute public information on hazard mitigation topics.**							
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.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9	**<u>Weather Radios</u>. Improve public access to weather alerts.**							
3.9.1	Promote the use of weather radios in households and businesses.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Lake View Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.9.2	Require the installation of weather radios in all public buildings and places of public assembly.	All	High	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
3.10	**<u>Disaster Warning.</u> Improve public warning systems.**							
3.10.1	Upgrade siren-warning systems to provide complete coverage to all jurisdictions.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
3.10.2	Upgrade critical communications infrastructure.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
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.**							
4.1	**<u>Open Space Easements and Acquisitions.</u> Acquire easements and fee-simple ownership of environmentally beneficial lands, such as hillsides, flood plains, 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 flood plain acquisition efforts.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
4.5	**<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.**							
4.5.1	Enforce water use restrictions during periods of drought to conserve existing water supplies.	Droughts/heat waves, wildfires	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Lake View Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
5	**Goal for Structural 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.**							
5.2	**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 in identified problem drainage areas.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3	**ommunity Shelters and Safe Rooms: Provide shelters from natural hazards for the safety of community residents.**							
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.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.2	Establish a program for subsidizing individual and community safe room construction in appropriate locations and facilities.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.3	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds

City of Northport Community Action Program

	Goal, Objectives and Mitigation Measures	Hazards Addressed	Priority	Timeline	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 natural 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 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.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
1.1.2	Integrate the findings and recommendations of this plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
1.2	**Geographic Information Systems (GIS). Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories.**							
1.2.3	Mark depths of flooding and storm surge immediately after each event. Enter and maintain these historical records in GIS.	Flooding	High	Ongoing	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.3	**Planning Studies. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							

City of Northport Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Flooding	Low	Long-Range	City Engineer	Action	TBD	TBD
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.	All	Medium	Mid-Range	Building Inspector	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	Building Inspector	Action	No Additional Cost	Existing Funds
1.3.4	Inventory and map existing fire hydrants throughout the county, and identify areas in need of new fire hydrants.	Wildfires	Low	Long-Range	Fire Department	Action	No Additional Cost	Existing Funds
1.3.5	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	Flooding	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
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.	Earthquake	Low	Long-Range	Mayor and Council	Project	TBD	TBD
1.4	**Zoning. Establish effective zoning controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							
1.4.1	Consider large lot size restrictions on flood prone areas designated on Flood Insurance Rate Maps.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

City of Northport Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Flooding	Low	Long-Range	Mayor and Council. Floodplain Manager	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	Building Inspector	Action	No Additional Cost	Existing Funds
1.4.4	Enact local ordinance that require community storm shelters within sizeable mobile home parks and subdivisions.	Tornadoes, Hurricanes, Severe Storms	High	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.5	**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 parks, conservation areas, landscaping, and drainage.**							
1.5.1	Examine regulatory options and feasibility of requiring open space areas for recreation, landscaping, and drainage control.	Flooding	Low	Long-Range	Building Inspector	Action	No Additional Cost	Existing Funds
1.6	**Flood Plain Management Regulations. Effectively administer and enforce local floodplain management regulations.**							
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.6.2	Maintain a library of technical assistance and guidance materials to support the local floodplain manager.	Flooding	Medium	Mid-Range	Floodplain Manager	Action	No Additional Cost	Existing Funds

City of Northport Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Flooding	Low	Long-Range	Mayor and Council, Floodplain Manager	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.6.5	Participate in the "Turn Around Don't Drown" program by purchasing and installing signs in known flash flood bridge overpass locations.	Flooding	Medium	Mid-Range	Mayor and Council	Project	No Additional Cost	Existing Funds
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.	Flooding	Medium	Ongoing	Floodplain Manager	Project	No Additional Cost	Existing Funds
1.7	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from natural hazard damages.**							
1.7.1	Promote good construction practices and proper code enforcement to mitigate structural failures during natural hazard events.	All	Medium	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds

City of Northport Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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."	Tornadoes, Hurricanes, Severe Storms	High	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
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.	Tornadoes, severe storms, winter storms/freezes, hurricanes	Low	Ongoing	Mayor and Council	Action	TBD	TBD
1.7.4	Ensure fire safety ordinances properly regulate open burning, the use of liquid fuel and electric space heaters.	Wildfires	Medium	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
1.7.5	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	All	Medium	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
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.	Tornadoes, Hurricanes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds
1.8	**Landscape Ordinances.** **Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff and improve urban aesthetics.**							
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.9	**Storm Water Management.** **Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**							

City of Northport Community Action Program

Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.9.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	Flooding	Medium	Long-Range	Mayor and Council, City Engineer	Action	No Additional Cost	Existing Funds
1.9.2	Develop, adopt and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Flooding	Low	Long-Range	Mayor and Council, City Engineer	Action	No Additional Cost	Existing Funds
1.9.3	Establish urban forestry program to help mitigate storm water runoff common in areas with large impervious surfaces.	Flooding	Low	Long-Range	Mayor and Council	Action	TBD	TBD
1.10	**Dam Safety Management. Establish a comprehensive dam safety program.**							
1.10.1	Support legislation to establish a State dam safety program.	Dam/Levee Failure	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.11	**Community Rating System Program (CRS). Increase participation of NFIP member communities in the CRS Program.**							
1.11.1	Apply for/maintain membership in the CRS Program; continue to upgrade rating.	Flooding	Medium	Short-Range	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.12	**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 disaster events.**							

City of Northport Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.12.1	Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	High	Mid-Range	City Engineer	Action	TBD	TBD
2	**<u>Goal for Property Protection:</u> Protect structures and their occupants and contents from the damaging effects of natural hazards.**							
2.1	**<u>Building Relocation.</u> 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	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.2	**<u>Acquisition.</u> Acquire flood prone buildings and properties and establish permanent open space.**							
2.2.1	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	Flooding	Medium	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
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.	Flooding	Medium	Ongoing	Building Inspector, Floodplain Manager	Project	TBD	FEMA HMA Grant
2.3	**<u>Building Elevation.</u> Elevate buildings in hazardous flood areas to safeguard against damages.**							

City of Northport Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Flooding	Medium	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.3.2	Repair, elevate and weatherize existing homes for low- to moderate-income families.	Flooding	Medium	Ongoing	Building Inspector	Project	TBD	FEMA HMA Grant
2.4	**<u>Flood Proofing.</u> Encourage flood proofing of buildings in hazardous flood areas to safeguard against damages.**							
2.4.1	Flood proof pre-FIRM non-residential buildings, where feasible.	Flooding	Medium	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.4.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	Flooding	Medium	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.5	**<u>Building Retrofits</u>. Retrofit vulnerable buildings to protect against natural hazards damages, including flooding, high winds, tornadoes, hurricanes, severe storms, and earthquakes.**							
2.5.1	Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Mid-Range	Mayor and Council, Building Inspector	Action	TBD	FEMA HMA Grant

City of Northport Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.5.2	Provide technical advisory assistance to building owners on available building retrofits to protect against natural hazards damages.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Ongoing	Building Inspector	Action	TBD	FEMA HMA Grant
2.6	**<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.**							
2.6.1	Promote the purchase of insurance coverage by property owners and renters for flood damages in high-risk areas.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
2.7	**<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 or construction of new facilities for maximum protection from all hazards.**							
2.7.1	Install lightning and/or surge protection on existing critical facilities.	Severe storms	High	Ongoing	City Engineer	Project	TBD	TBD
2.8	**<u>Back Up Power:</u> Assure uninterrupted power supplies during emergency events.**							
2.8.1	Install backup power generators for critical facilities.	Hurricanes, Tornadoes, Severe Storms	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
3	**<u>Goal for Public Education and Outreach</u>. Educate and inform the public about the risks of hazards and the techniques available to reduce threats to life and property.**							

City of Northport Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.1	**<u>Map Information.</u> Increase public access to Flood Insurance Rate Map (FIRM) information.**							
3.1.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications and newspaper announcements.	All	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
3.2	**<u>Outreach Projects.</u> Conduct regular public events to inform the public of hazards and mitigation measures.**							
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.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

City of Northport Community Action Program

Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.2.5	Educate citizens on water saving techniques.	Drought	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.3	**Real Estate Disclosure. Encourage real estate agents to disclose flood plain location for property listings.**							
3.3.1	Arrange with the Multiple Listing Service (MLS) to require floodplain location disclosure as a condition for each real estate listing.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
3.5	**Education Programs. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.5.2	Educate homeowners about structural and non-structural retrofitting of vulnerable homes.	Earthquake	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.6	**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.**							
3.6.1	Distribute the 2014 plan to local officials, stakeholders, and interested individuals through internet download.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.7	**Technical Assistance. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**							

City of Northport Community Action Program

Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.7.1	Provide technical assistance to homeowners, builders, and developers on flood protection alternatives.	Flooding	Low	Ongoing	Floodplain Manager	Action	No Additional Cost	Existing Funds
3.8	**Mass Media Relations. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, and on-line social networking to increase public awareness and distribute public information on hazard mitigation topics.**							
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.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9	**Weather Radios. Improve public access to weather alerts.**							
3.9.1	Promote the use of weather radios in households and businesses.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9.2	Require the installation of weather radios in all public buildings and places of public assembly.	All	High	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9.3	Distribute weather radios and emergency response instructions to municipal residents.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	FEMA HMA Grant
3.10	**Disaster Warning. Improve public warning systems.**							
3.10.1	Upgrade siren-warning systems to provide complete coverage to all jurisdictions.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant

City of Northport Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.10.2	Upgrade critical communications infrastructure.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
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, flood plains, 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 flood plain acquisition efforts.	Flooding	Medium	Mid-Range	Mayor and Council	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	Keep builders and developers informed of Federal wetlands permitting requirements of the Corps of Engineers.	Flooding	Medium	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
4.2.2	Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.	Flooding	Medium	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
4.3	**Urban Forestry Programs. Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wild fires within urban areas.**							

City of Northport Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
4.3.1	Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
4.5	**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.**							
4.5.1	Enforce water use restrictions during periods of drought to conserve existing water supplies.	Droughts/heat waves, wildfires	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
5	**Goal for Structural 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 Maintenance. Improve maintenance programs for streams and drainage ways.**							
5.1.1	Prepare and implement standard operating procedures and guidelines for drainage system maintenance.	Flooding	Medium	Ongoing	City Engineer	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 in identified problem drainage areas.	Flooding	Medium	Mid-Range	City Engineer	Project	TBD	FEMA HMA Grant
5.2.2	Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.	Drought	Low	Mid-Range	City Engineer	Project	TBD	FEMA HMA Grant

City of Northport Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
5.3	**<u>Community Shelters and Safe Rooms</u>: Provide shelters from natural hazards for the safety of community residents.**							
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.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.2	Establish a program for subsidizing individual and community safe room construction in appropriate locations and facilities.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.3	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds

City of Tuscaloosa Community Action Program

	Goal, Objectives and Mitigation Measures	Hazards Addressed	Priority	Timeline	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 natural 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 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.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.1.2	Integrate the findings and recommendations of this plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.2	**Geographic Information Systems (GIS). Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories.**							

City of Tuscaloosa Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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, hurricane surge areas, tornado tracks, disaster events and their extents, and a comprehensive inventory of critical facilities within all jurisdictions.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	All	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.2.3	Mark depths of flooding and storm surge immediately after each event. Enter and maintain these historical records in GIS.	Flooding	High	Ongoing	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.3	**<u>Planning Studies</u>. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
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.	Flooding	Medium	Mid-Range	Mayor and Council, City Engineer	Action	TBD	TBD
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.	All	Medium	Mid-Range	Building Inspector	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	City Engineer	Action	No Additional Cost	Existing Funds

City of Tuscaloosa Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.3.4	Inventory and map existing fire hydrants throughout the county, and identify areas in need of new fire hydrants.	Wildfires	Low	Long-Range	Fire Department	Action	No Additional Cost	Existing Funds
1.3.5	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.	Flooding	Medium	Mid-Range	Mayor and Council, City Engineer	Action	TBD	TBD
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.	Earthquake	Low	Long-Range	City Engineer	Project	TBD	TBD
1.4	**<u>Zoning</u>. Establish effective zoning controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							
1.4.1	Consider large lot size restrictions on flood prone areas designated on Flood Insurance Rate Maps.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.4.2	Evaluate additional land use restrictions within designated flood zones, such as prohibition of storage of buoyant materials, storage of hazardous materials, restrictive development of flood ways, among others.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	Building Inspector, City Engineer	Action	No Additional Cost	Existing Funds
1.4.4	Enact local ordinance that require community storm shelters within sizeable mobile home parks and subdivisions.	Tornadoes, Hurricanes, Severe Storms	High	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.5	**<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 parks, conservation areas, landscaping, and drainage.**							

City of Tuscaloosa Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.5.1	Examine regulatory options and feasibility of requiring open space areas for recreation, landscaping, and drainage control.	Flooding	Low	Long-Range	City Engineer	Action	No Additional Cost	Existing Funds
1.6	**<u>Flood Plain Management Regulations.</u> Effectively administer and enforce local floodplain management regulations.**							
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.6.2	Maintain a library of technical assistance and guidance materials to support the local floodplain manager.	Flooding	Medium	Mid-Range	Floodplain Manager	Action	No Additional Cost	Existing Funds
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

City of Tuscaloosa Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.6.5	Participate in the "Turn Around Don't Drown" program by purchasing and installing signs in known flash flood bridge overpass locations.	Flooding	Medium	Mid-Range	Mayor and Council	Project	No Additional Cost	Existing Funds
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.	Flooding	Medium	Ongoing	Floodplain Manager	Project	No Additional Cost	Existing Funds
1.7	**Building and Technical Codes. Review local codes for effectiveness of standards to protect buildings and infrastructure from natural hazard damages.**							
1.7.1	Promote good construction practices and proper code enforcement to mitigate structural failures during natural hazard events.	All	Medium	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
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."	Tornadoes, Hurricanes, Severe Storms	High	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
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.	Tornadoes, severe storms, winter storms/freezes, hurricanes	Low	Ongoing	Mayor and Council	Action	TBD	TBD
1.7.4	Ensure fire safety ordinances properly regulate open burning, the use of liquid fuel and electric space heaters.	Wildfires	High	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
1.7.5	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	All	High	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds

City of Tuscaloosa Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Tornadoes, Hurricanes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds
1.8	**<u>Landscape Ordinances.</u> Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff and improve urban aesthetics.**							
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Wildfires	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.9	**<u>Storm Water Management.</u> Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**							
1.9.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	Flooding	Medium	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.9.2	Develop, adopt and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.10	**<u>Dam Safety Management.</u> Establish a comprehensive dam safety program.**							
1.10.1	Support legislation to establish a State dam safety program.	Dam/Levee Failure	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

City of Tuscaloosa Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.11	**Community Rating System Program (CRS). Increase participation of NFIP member communities in the CRS Program.**							
1.11.1	Apply for/maintain membership in the CRS Program; continue to upgrade rating.	Flooding	Medium	Short-Range	Floodplain Manager	Action	No Additional Cost	Existing Funds
1.12	**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 disaster events.**							
1.12.1	Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	High	Mid-Range	TBD	Action	TBD	TBD
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.	Wildfire	Low	Long-Range	Fire Department	Project	No Additional Cost	Existing Funds
2	**Goal for Property Protection: Protect structures and their occupants and contents from the damaging effects of natural 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	Ongoing	Building Inspector	Project	TBD	FEMA HMA Grant

City of Tuscaloosa Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.2	**Acquisition. Acquire flood prone buildings and properties and establish permanent open space.**							
2.2.1	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	Flooding	Medium	Ongoing	Building Inspector	Project	TBD	FEMA HMA Grant
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.	Flooding	Medium	Ongoing	Building Inspector	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	Ongoing	Building Inspector	Project	TBD	FEMA HMA Grant
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; where feasible, elevation is preferable to flood proofing.	Flooding	Medium	Ongoing	Building Inspector	Project	TBD	FEMA HMA Grant
2.3.2	Repair, elevate and weatherize existing homes for low- to moderate-income families.	Flooding	Medium	Ongoing	Building Inspector	Project	TBD	FEMA HMA Grant
2.4	**Flood Proofing. Encourage flood proofing of buildings in hazardous flood areas to safeguard against damages.**							

City of Tuscaloosa Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.4.1	Flood proof pre-FIRM non-residential buildings, where feasible.	Flooding	Medium	Ongoing	Building Inspector	Project	TBD	FEMA HMA Grant
2.4.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	Flooding	Medium	Ongoing	City Engineer, Building Inspector	Project	TBD	FEMA HMA Grant
2.5	**<u>Building Retrofits</u>. Retrofit vulnerable buildings to protect against natural hazards damages, including flooding, high winds, tornadoes, hurricanes, severe storms, and earthquakes.**							
2.5.1	Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Mid-Range	Building Inspector	Action	TBD	FEMA HMA Grant
2.5.2	Provide technical advisory assistance to building owners on available building retrofits to protect against natural hazards damages.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Ongoing	Building Inspector	Action	TBD	FEMA HMA Grant
2.6	**<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.**							
2.6.1	Promote the purchase of insurance coverage by property owners and renters for flood damages in high-risk areas.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds

City of Tuscaloosa Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.6.2	Promote the purchase of crop insurance to cover potential losses due to drought.	Drought	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
2.7	**<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 or construction of new facilities for maximum protection from all hazards.**							
2.7.1	Install lightning and/or surge protection on existing critical facilities.	Severe storms	High	Ongoing	Building Inspector	Project	TBD	TBD
2.7.2	Conduct ongoing tree trimming programs along power lines.	Severe storms	High	Ongoing	TBD	Action	TBD	TBD
2.8	**<u>Back Up Power:</u> Assure uninterrupted power supplies during emergency events.**							
2.8.1	Install backup power generators for critical facilities.	Hurricanes, Tornadoes, Severe Storms	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
3	**<u>Goal for Public Education and Outreach</u>. Educate and inform the public about the risks of hazards and the techniques available to reduce threats to life and property.**							
3.1	**<u>Map Information.</u> Increase public access to Flood Insurance Rate Map (FIRM) information.**							
3.1.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications and newspaper announcements.	All	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

City of Tuscaloosa Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.2	**<u>Outreach Projects.</u> Conduct regular public events to inform the public of hazards and mitigation measures.**							
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.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	All	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.2.5	Educate citizens on water saving techniques.	Drought	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.2.6	Educate farmers on soil and water conservation practices.	Drought	High	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.3	**<u>Real Estate Disclosure.</u> Encourage real estate agents to disclose flood plain location for property listings.**							
3.3.1	Arrange with the Multiple Listing Service (MLS) to require floodplain location disclosure as a condition for each real estate listing.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

City of Tuscaloosa Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
3.4	**<u>Library.</u> Use local library resources to educate the public on hazard risks and mitigation alternatives.**							
3.4.1	Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.5	**<u>Education Programs</u>. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**							
3.5.1	Distribute hazard mitigation brochures to students through area schools.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.5.2	Educate homeowners about structural and non-structural retrofitting of vulnerable homes.	Earthquake	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.6	**<u>Community Hazard Mitigation Plan Distribution</u>. Distribute the hazard mitigation plan to elected officials, interested agencies and organizations, businesses, and residents, using all available means of publication and distribution.**							
3.6.1	Distribute the 2014 plan to local officials, stakeholders, and interested individuals through internet download.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.7	**<u>Technical Assistance</u>. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**							

City of Tuscaloosa Community Action Program

Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.7.1	Provide technical assistance to homeowners, builders, and developers on flood protection alternatives.	Flooding	Low	Ongoing	Floodplain Manager	Action	No Additional Cost	Existing Funds
3.8	**<u>Mass Media Relations</u>. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, and on-line social networking to increase public awareness and distribute public information on hazard mitigation topics.**							
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.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9	**<u>Weather Radios</u>. Improve public access to weather alerts.**							
3.9.1	Promote the use of weather radios in households and businesses.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.9.2	Require the installation of weather radios in all public buildings and places of public assembly.	All	High	Short-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
3.10	**<u>Disaster Warning.</u> Improve public warning systems.**							
3.10.1	Upgrade siren-warning systems to provide complete coverage to all jurisdictions.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
3.10.2	Upgrade critical communications infrastructure.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant

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Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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, flood plains, 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 flood plain acquisition efforts.	Flooding	Medium	Mid-Range	Mayor and Council	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	Keep builders and developers informed of Federal wetlands permitting requirements of the Corps of Engineers.	Flooding	Medium	Ongoing	City Engineer	Action	No Additional Cost	Existing Funds
4.2.2	Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.	Flooding	Medium	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
4.3	**Urban Forestry Programs. Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wild fires within urban areas.**							
4.3.1	Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

City of Tuscaloosa Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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4.5.1	Enforce water use restrictions during periods of drought to conserve existing water supplies.	Droughts/heat waves, wildfires	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
5	**<u>Goal for Structural 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 Maintenance.</u> Improve maintenance programs for streams and drainage ways.**							
5.1.1	Prepare and implement standard operating procedures and guidelines for drainage system maintenance.	Flooding	Medium	Ongoing	City Engineer	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 in identified problem drainage areas.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
5.2.2	Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.	Drought	Low	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3	**<u>Community Shelters and Safe Rooms</u>: Provide shelters from natural hazards for the safety of community residents.**							

City of Tuscaloosa Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.2	Establish a program for subsidizing individual and community safe room construction in appropriate locations and facilities.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.3	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds

Town of Vance Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	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 natural 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 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.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
1.1.2	Integrate the findings and recommendations of this plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
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.	All	Medium	Mid-Range	Mayor and Council	Action	TBD	TBD
1.2	**Geographic Information Systems (GIS). Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories.**							

Town of Vance Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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, hurricane surge areas, tornado tracks, disaster events and their extents, and a comprehensive inventory of critical facilities within all jurisdictions.	All	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	All	Low	Long-Range	Mayor and Council	Action	TBD	TBD
1.3	**<u>Planning Studies</u>. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**							
1.3.4	Inventory and map existing fire hydrants throughout the county, and identify areas in need of new fire hydrants.	Wildfires	Low	Long-Range	Fire Department	Action	No Additional Cost	Existing Funds
1.4	**<u>Zoning</u>. Establish effective zoning controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**							
1.4.1	Consider large lot size restrictions on flood prone areas designated on Flood Insurance Rate Maps.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Vance Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Flooding	Low	Long-Range	City Engineer	Action	No Additional Cost	Existing Funds
1.6	**<u>Flood Plain Management Regulations.</u> Effectively administer and enforce local floodplain management regulations.**							
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.6.2	Maintain a library of technical assistance and guidance materials to support the local floodplain manager.	Flooding	Medium	Mid-Range	Floodplain Manager	Action	No Additional Cost	Existing Funds
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
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.	Flooding	Medium	Mid-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.7	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from natural hazard damages.**							

Town of Vance Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.7.1	Promote good construction practices and proper code enforcement to mitigate structural failures during natural hazard events.	All	Medium	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
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."	Tornadoes, Hurricanes, Severe Storms	High	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
1.7.4	Ensure fire safety ordinances properly regulate open burning, the use of liquid fuel and electric space heaters.	Wildfires	High	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
1.7.5	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.	All	High	Ongoing	Building Inspector	Action	No Additional Cost	Existing Funds
1.8	**Landscape Ordinances.** **Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff and improve urban aesthetics.**							
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.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.9	**Storm Water Management.** **Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**							
1.9.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.	Flooding	Medium	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds

Town of Vance Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
1.9.2	Develop, adopt and implement subdivision regulations that require proper stormwater infrastructure design and construction.	Flooding	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
1.10	**<u>Dam Safety Management.</u> Establish a comprehensive dam safety program.**							
1.10.1	Support legislation to establish a State dam safety program.	Dam/Levee Failure	Low	Long-Range	Mayor and Council	Action	No Additional Cost	Existing Funds
2	**<u>Goal for Property Protection:</u> Protect structures and their occupants and contents from the damaging effects of natural hazards.**							
2.1	**<u>Building Relocation.</u> 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	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.2	**<u>Acquisition.</u> Acquire flood prone buildings and properties and establish permanent open space.**							
2.2.1	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.	Flooding	Medium	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.3	**<u>Building Elevation.</u> Elevate buildings in hazardous flood areas to safeguard against damages.**							

Town of Vance Community Action Program									
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
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.	Flooding	Medium	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.4	**<u>Flood Proofing.</u> Encourage flood proofing of buildings in hazardous flood areas to safeguard against damages.**							
2.4.1	Flood proof pre-FIRM non-residential buildings, where feasible.	Flooding	Medium	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.4.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.	Flooding	Medium	Ongoing	Mayor and Council, Building Inspector	Project	TBD	FEMA HMA Grant
2.5	**<u>Building Retrofits</u>. Retrofit vulnerable buildings to protect against natural hazards damages, including flooding, high winds, tornadoes, hurricanes, severe storms, and earthquakes.**							
2.5.1	Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Mid-Range	Mayor and Council, Building Inspector	Action	TBD	FEMA HMA Grant
2.5.2	Provide technical advisory assistance to building owners on available building retrofits to protect against natural hazards damages.	Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Medium	Ongoing	Mayor and Council, Building Inspector	Action	TBD	FEMA HMA Grant

Town of Vance Community Action Program

	Goal, Objectives and Mitigation Measures	Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
2.7	**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 or construction of new facilities for maximum protection from all hazards.**							
2.7.1	Install lightning and/or surge protection on existing critical facilities.	Severe storms	High	Ongoing	City Engineer	Project	TBD	TBD
2.8	**Back Up Power: Assure uninterrupted power supplies during emergency events.**							
2.8.1	Install backup power generators for critical facilities.	Hurricanes, Tornadoes, Severe Storms	Medium	Ongoing	City Engineer	Project	TBD	FEMA HMA Grant
3	**Goal for Public Education and Outreach. Educate and inform the public about the risks of hazards and the techniques available to reduce threats to life and property.**							
3.6	**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.**							
3.6.1	Distribute the 2014 plan to local officials, stakeholders, and interested individuals through internet download.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.7	**Technical Assistance. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives**							
3.7.1	Provide technical assistance to homeowners, builders, and developers on flood protection alternatives.	Flooding	Low	Ongoing	Floodplain Manager	Action	No Additional Cost	Existing Funds

Town of Vance Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
3.9	**<u>Weather Radios</u>. Improve public access to weather alerts.**							
3.9.1	Promote the use of weather radios in households and businesses.	All	Medium	Ongoing	Mayor and Council	Action	No Additional Cost	Existing Funds
3.10	**<u>Disaster Warning.</u> Improve public warning systems.**							
3.10.1	Upgrade siren-warning systems to provide complete coverage to all jurisdictions.	Flooding	Medium	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
3.10.2	Upgrade critical communications infrastructure.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
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.**							
4.1	**<u>Open Space Easements and Acquisitions.</u> Acquire easements and fee-simple ownership of environmentally beneficial lands, such as hillsides, flood plains, 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 flood plain acquisition efforts.	Flooding	Medium	Mid-Range	Mayor and Council	Project	TBD	FEMA HMA Grant
4.2	**<u>River/Stream Corridor Restoration and Protection.</u> Restore and protect river and stream corridors within areas.**							
4.2.1	Keep builders and developers informed of Federal wetlands permitting requirements of the Corps of Engineers.	Flooding	Medium	Ongoing	Building Inspector, City Engineer	Action	No Additional Cost	Existing Funds

Town of Vance Community Action Program								
Goal, Objectives and Mitigation Measures		Hazards Addressed	Priority	Timeline	Lead Responsibility for Carrying Out Measure	Action or Project	Estimated Cost	Funding Source
5	**Goal for Structural 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.**							
5.2	**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 in identified problem drainage areas.	Flooding	Medium	Mid-Range	Mayor and Council, City Engineer	Project	TBD	FEMA HMA Grant
5.2.2	Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.	Drought	Low	Mid-Range	Mayor and Council, City Engineer	Project	TBD	FEMA HMA Grant
5.3	**Community Shelters and Safe Rooms: Provide shelters from natural hazards for the safety of community residents.**							
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.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.2	Establish a program for subsidizing individual and community safe room construction in appropriate locations and facilities.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	TBD	FEMA HMA Grant
5.3.3	Encourage the construction of safe rooms in new and existing homes and buildings.	Hurricanes, Tornadoes, Severe Storms	High	Ongoing	Mayor and Council	Project	No Additional Cost	Existing Funds

2014
Tuscaloosa County, Alabama
Multi-Hazard Mitigation Plan

APPENDICES

Prepared under the direction of the
Tuscaloosa County Hazard Mitigation Planning Committee

With the support of the Tuscaloosa County EMA by:

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February 25, 2015

2014 Tuscaloosa County, Alabama, Multi-Hazard Mitigation Plan

Appendices

Town of Brookwood, Town of Coaling, Town of Coker, Town of Lake View, City of Northport, City of Tuscaloosa, Town of Vance, and Tuscaloosa County

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Appendix A
Federal Requirements for Local Mitigation Plans

App. A - Federal Requirements for Local Mitigation Plans

1.0 Compliance

The 2014 Tuscaloosa 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

This report assesses community mechanisms that can affect hazard mitigation activities in a jurisdiction. This assessment provides an overview of the capabilities of Tuscaloosa County jurisdictions to implement mitigation strategies, and it identifies any existing gaps or weaknesses that could hinder mitigation activities under consideration in this plan. The results of this assessment help determine the types of mitigation activities a local government can realistically undertake over its five-year action program framework included in Chapter 6 Mitigation Strategy.

The following table lists each jurisdiction in Tuscaloosa County and shows the results of a comprehensive questionnaire that was distributed by the planning team to all participating jurisdictions. The survey results show whether or not certain indicators of a community's capabilities to carry our mitigation actions are in place. These indicators examine planning and regulatory tools, mitigation project experience, and staffing.

Table B-1 Community Capabilities Assessment

JURISDICTION	enforce zoning ord.	administer subdivision regs.	enforce building and technical codes	up-to-date comp. plan adopted in last 5 years	5-6 year capital improvements plan updated annually	experience with FEMA grant programs for hazard mitigation projects	professional urban planner on staff	professional engineer on staff	Certified Floodplain Manager on staff	full-time building inspector on staff
Tuscaloosa County	N	Y	N	N	N	Y	N	Y	Y	N
Brookwood	Y	Y	Y	N	N	Y	N	N	N	Y
Coaling	Y	Y	Y	N	N	Y	N	N	N	Y
Coker	N	N	N	N	N	Y	N	N	N	N
Lake View	N	N	N	N	N	N	N	N	N	N
Northport	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
Tuscaloosa	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Vance	Y	Y	Y	N	N	Y	N	N	N	Y

KEY: Y = Yes N = No

Appendix C
2009 Plan Implementation Status

App. C – 2009 Plan Implementation Status

1.0 Scope and Methodology

As part of the 2014 plan update, each jurisdiction revisited its original five-year mitigation action program from the 2009 Tuscaloosa County, Alabama, Multi-Hazard Mitigation Plan. FEMA guidance requires this review of previous mitigation actions. Each action or project must be identified as completed, deleted or deferred actions. If a mitigation action remained unchanged, the jurisdiction must explain why no changes occurred. The community must also describe any challenges that hindered implementation of mitigation measures and how these might be dealt with in future updates. Technical, political, financial, legal, administrative, and agency coordination issues need to be evaluated for any potential hindrances to effective implementation of mitigation measures.

This appendix includes the Community Mitigation Action Programs adopted by Tuscaloosa County and its participating jurisdictions in the 2009 plan. Actions identified in the 2009 plan were evaluated to obtain the current implementation status. Each jurisdiction or agency responsible for implementing a mitigation measure in 2009 was asked to provide a status update by classifying each action as completed, ongoing but completed, deferred, or deleted. Further, agencies were asked to provide comments on any milestones achieved or impediments to implementation of the mitigation measures.

To accomplish this status assessment, a questionnaire based on the mitigation action program from the 2009 plan was distributed to each jurisdiction. This questionnaire was sent to all members of the Hazard Mitigation Planning Committee and the lead agencies or persons responsible for implementing each action. The survey provided each jurisdiction with a mechanism to provide feedback on the implementation status of the mitigation measures along with any relevant comments.

Results from this survey are highlighted on the table found in this appendix. The table shows an identifying number for each jurisdiction (e.g., Tuscaloosa County is 1, Town of Brookwood is 2, Town of Coaling is 3, etc.) for cross reference to the reasons for not completing the measure. If a mitigation measure was deferred or recommended for deletion, the jurisdiction was required to give the reason. The reasons for deferring or deleting a measure were categorized as lack of funding, administrative, political, technical, or legal. These categories are defined below:

Lack of funding	Lack of funding or budget constraints impeded the implementation of the mitigation measure
Administrative	Inadequate staff resources to implement and maintain the mitigation measure
Political	Lacks local political support of the mitigation measure
Technical	Mitigation measure was not technically feasible
Legal	Lacks the legal authority to implement the mitigation measure

2.0 Summary of Results

- ✓ The 2009 Tuscaloosa County Multi-Hazard Mitigation Plan contained approximately 33 mitigation measures. Only 6 of these mitigation measures were applicable to all the participating jurisdictions while 33 measures were adopted by at least one of the eight jurisdictions.
- ✓ The majority of the mitigation measures were completed or completed, but on-going.
- ✓ Some mitigation measures were deferred. The most prevailing reason given for deferring a mitigation measure was technical.
- ✓ 5 of these measures were recommended for deletion by one or more of the jurisdictions. The predominant reason given for deleting these measures was the lead agency determined that the adopted mitigation measure was not applicable to their community or was under the jurisdiction of another agency.
- ✓ The 2009 Plan included measures for Moundville, but moving forward, they will participate in the Hale County plan.

The Key for Table C-1 is as follows:

C = Completed this 2009 mitigation measure.

O = Completed this ongoing measure and will continue in the 2014 Plan.

D = This 2009 mitigation measure was not completed but defer to the 2014 Plan.

X = Delete: this 2009 mitigation measure was not completed or will no longer be ongoing for the 2014 Plan.

Numbers next to "Reason for not Completing Mitigation Measure" refers to jurisdiction (e.g., number [4,] refers to Coker)

Table C-1. 2009 Plan Implementation Status

#	Mitigation Measure	Tuscaloosa County [1]	Brookwood [2]	Coaling [3]	Coker [4]	Lake View [5]	Northport [6]	Tuscaloosa [7]	Vance [8]	Reason Why Measure Was Not Completed
1.1.1	Install additional outdoor warning sirens.	O	O	O		O	O	O	O	
1.1.2	Install additional outdoor warning sirens in jurisdiction						O			
1.1.3	Upgrade communications equipment/system						O		O	
1.1.4	Provide NOAA weather radios to residents								O	
1.1.5	Upgrade outdoor warning sirens to telemetry system								D	Lack of Funding [8]
1.2.1	Construct community storm shelters	O	O	O	O	O	O	O	O	

#	Mitigation Measure	Tuscaloosa County [1]	Brookwood [2]	Coaling [3]	Coker [4]	Lake View [5]	Northport [6]	Tuscaloosa [7]	Vance [8]	Reason Why Measure Was Not Completed
1.2.2	Construct individual safe rooms/storm shelters.	O						O		
1.2.3	Construct storm retrofits to critical facilities and educational institutions.	O						O		
1.3	Improve disaster response and recovery		X	X	X	X	X	X	X	Technical [2, 3,4, 5, 6, 7, 8] Legal [2, 3, 4, 5, 6, 7, 8]
2.1	Reduce losses to critical facilities/assets						O	O	O	
2.1.1	Upgrade or replace failing bridges.	X								Legal [1]
2.1.2	Provide hillside modification and stabilization	O								
2.1.3	Provide emergency generators to critical facilities	O	O					O		

#	Mitigation Measure	Tuscaloosa County [1]	Brookwood [2]	Coaling [3]	Coker [4]	Lake View [5]	Northport [6]	Tuscaloosa [7]	Vance [8]	Reason Why Measure Was Not Completed
2.1.4	Correct failing dams					X				Legal [5]
2.1.5	Incorporate building hardening design features into construction of new critical facilities and educational institutions							O		
2.2	Continue participation in NFIP program	O	O	O	O	O	O	O	O	
2.2.1	Enforce floodplain management requirements; regulate construction or improvements in Special Flood Hazard Areas (SFHAs).	O	O	O	O	O	O	O	O	
2.3	Provide and Maintain essential public services						X	X	X	Technical [6, 7, 8]
2.3.1	Install emergency generators at critical facilities			O	O		O		O	
2.3.2	Provide upgrades to water treatment plan							O		

#	Mitigation Measure	Tuscaloosa County [1]	Brookwood [2]	Coaling [3]	Coker [4]	Lake View [5]	Northport [6]	Tuscaloosa [7]	Vance [8]	Reason Why Measure Was Not Completed
2.3.3	Provide raw water pump station, power substation and back-up generator							C		
2.3.4	Install emergency generators to water and sewer critical facilities							O		
2.3.5	Upgrade power distribution system at University of Alabama campus							O		
2.4	<u>Reduce losses due to drainage problems</u>				O		O	O		
2.4.1	Upgrade drainage systems	O				O	O		O	
2.4.2	Encourage upgrades and repairs to private dams	O								
2.4.3	Address washout problems on roadways					O				

#	Mitigation Measure	Tuscaloosa County [1]	Brookwood [2]	Coaling [3]	Coker [4]	Lake View [5]	Northport [6]	Tuscaloosa [7]	Vance [8]	Reason Why Measure Was Not Completed
3.1	Maintain operations of critical businesses and major employers	X	X	X	X	X	X	X	X	Technical [1, 2, 3, 4, 5, 6, 7, 8]
4.1	Identify, protect and properly manage floodplains	O	O	O	O	O	O	O	O	
4.1.1	Provide drainage area revitalization improvements	O								
4.2	Encourage non-participating communities to participate in NFIP program and enforce NFIP local codes and regulations.	C					C			
5.1	Continue to train severe weather spotters	O	O	O	O	O	O	O	O	

Appendix D
Hazard Ratings and Descriptions

App. D – Hazard Ratings and Descriptions

1.0 Scope and Methodology

1.1 The HMPC Hazard Identification Exercises

The tables in this Appendix show the results of the Hazard Mitigation Planning Committee (HMPC) responses to the hazard identification exercises presented at its April 17, 2014, committee meeting. These results are not necessarily supported by other resources evaluated in Chapter 5 – Risk Assessment, but are, nonetheless, indicators of the location, probability, and extent of hazards affecting Tuscaloosa County jurisdictions. These responses are those perceived by the HMPC membership, based on local knowledge and experience of the members. This exercise serves as a resource to help identify the hazards affecting each jurisdiction and determine the probability and extents (severity or magnitude) and how these measures of community impacts vary among Tuscaloosa County jurisdictions. The averages of the ratings compare how the location and impacts of hazards could vary among the jurisdictions.

Key.

The following key to the tables describes the hazard ratings:

LOCATION - WHETHER THE JURISDICTION IS AFFECTED BY THE HAZARD
1 = YES
0 = NO
PROBABILITY - THE LIKELIHOOD THAT THE HAZARD WOULD OCCUR IN THIS JURSIDICTION
5 - VERY HIGH
4 - HIGH
3 - MEDIUM
2 - LOW
1 - MINIMUM
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

1.2 Summary of Results

Location of natural hazards

- ✓ The HMPC has identified the following hazards that could occur in all jurisdictions of Tuscaloosa County: severe storms, tornadoes, floods, hurricanes, winter storms/freezes, droughts/heat waves, wildfires, dam/levee failures, landslides, earthquakes, sinkholes (land subsidence), and manmade and technological hazards.

Probability of natural hazards

- ✓ According to the HMPC, the most natural hazards most likely to occur are severe storms (3.6), tornadoes (3.3), floods (3.3), droughts/heat waves (3.3), and winter storms/freezes (3.2).
- ✓ The natural hazards that have some likelihood of occurring are hurricanes (3.0), and wildfires (2.9).
- ✓ The natural hazards with the lowest probability of occurrence are dam/levee failure (1.8), sinkholes (1.6), earthquakes (1.4), and landslides (1.2).

Extent of natural hazards

- ✓ The most potentially severe hazards for Tuscaloosa County are tornadoes (3.4) and severe storms (3.3).
- ✓ Hurricanes (2.5), dam/levee failures (2.5), floods (2.4), winter storms/freezes (2.4), wildfires (2.3), and droughts/heat waves (2.1) have a potential severity of low to medium in extent.
- ✓ The least severe natural hazards are earthquakes (1.8), sinkholes (1.3), and landslides (1.1).

Manmade and technological hazards

- ✓ Manmade and technological hazards could occur in any location within all jurisdictions.
- ✓ Probability of manmade and technological hazards, on average, is moderate at 2.6.
- ✓ The severity of extent of manmade and technological hazards, on average, is also moderate at 2.8.

Table D-1. Tuscaloosa County HMPC Identification and Ratings of Hazards

Hazard	Geographic Area	Location (2014)	Probability (2014) *	Extent (2014) *
Tornadoes	Tuscaloosa County	1	**3.9** (5, 4, 4, 5, 5, 3, 5, 5, 2, 1)	**3.5** (3, 4, 3, 3, 4, 3, 4, 5, 2, 4)
	Brookwood	1	**3.2** (3, 5, 5, 2, 1)	**3.2** (3, 4, 3, 2, 4
	Coaling	1	**3.2** (3, 5, 5, 2, 1)	**3.2** (3, 4, 3, 2, 4)
	Coker	1	**3.2** (3, 5, 5, 2, 1)	**3.2** (3, 4, 3, 2, 4)
	Lake View	1	**3.2** (3, 5, 5, 2, 1)	**3.2** (3, 4, 3, 2, 4)
	Moundville	1	**3.2** (3, 5, 5, 2, 1)	**3.2** (3, 4, 3, 2, 4)
	Northport	1	**3.4** (3, 3, 4, 4, 3, 5, 5, 2, 1, 4)	**3.7** (4, 4, 4, 4, 3, 4, 3, 2, 4, 5)
	Tuscaloosa	1	**3.7** (3, 5, 4, 5, 4, 3, 3, 4, 5, 5, 2, 1)	**3.8** (3, 5, 4, 5, 4, 3, 3, 4, 4, 5, 2, 4)
	Vance	1	**3** (2, 3, 5, 5, 2, 1)	**3.3** (4, 3, 4, 3, 2, 4)
	Woodstock	1	**3.2** (3, 5, 5, 2, 1)	**3.2** (3, 4, 3, 2, 4)
	AVERAGE		**3.3**	**3.4**
Severe Storms	Tuscaloosa County	1	**4.2** (5, 4, 5, 5, 5, 3, 5, 5, 1)	**3.7** (3, 4, 3, 3, 4, 3, 4, 5, 4)
	Brookwood	1	**3.4** (3, 5, 5, 3, 1)	**3.2** (3, 4, 3, 2, 4)
	Coaling	1	**3.4** (3, 5, 5, 3, 1)	**3.2** (3, 4, 3, 2, 4)
	Coker	1	**3.4** (3, 5, 5, 3, 1)	**3.2** (3, 4, 3, 2, 4
	Lake View	1	**3.4** (3, 5, 5, 3, 1)	**3.2** (3, 4, 3, 2, 4
	Moundville	1	**3.4** (3, 5, 5, 3, 1)	**3.2** (3, 4, 3, 2, 4
	Northport	1	**4** (4, 5, 5, 5, 3, 5, 5, 3, 1, 4)	**3.1** (3, 5, 2, 2, 3, 4, 3, 2, 4, 3)
	Tuscaloosa	1	**4.3** (4, 5, 4, 5, 5, 4, 5, 5, 5, 5, 3, 1)	**3.3** (3, 5, 4, 4, 2, 2, 2, 2, 4, 5, 2, 4)

Hazard	Geographic Area	Location (2014)	Probability (2014) *	Extent (2014) *
	Vance	1	**3.5** (4, 3, 5, 5, 3, 1)	**3.3** (4, 3, 4, 3, 2, 4)
	Woodstock	1	**3.4** (3, 5, 5, 3, 1)	**3.2** (3, 4, 3, 2, 4)
	AVERAGE		**3.6**	**3.3**
Floods	Tuscaloosa County	1	**3.5** (4, 2, 3, 5, 3, 2, 5, 5, 3, 3)	**2.8** (2, 2, 3, 4, 3, 2, 2, 5, 2, 3)
	Brookwood	1	**3** (2, 5, 2, 3, 3)	**2** (2, 2, 2, 1, 3)
	Coaling	1	**3** (2, 5, 2, 3, 3)	**2** (2, 2, 2, 1, 3)
	Coker	1	**3.2** (3, 5, 2, 3, 3)	**2.2** (3, 2, 2, 1, 3)
	Lake View	1	**3.2** (3, 5, 2, 3, 3)	**2.4** (3, 2, 2, 2, 3)
	Moundville	1	**3.6** (3, 5, 4, 3, 3)	**2.4** (3, 2, 2, 2, 3)
	Northport	1	**3.6** (3, 4, 2, 5, 3, 5, 5, 3, 3, 3)	**2.9** (3, 5, 2, 1, 3, 2, 5, 2, 3, 3)
	Tuscaloosa	1	**3.5** (4, 3, 2, 4, 2, 4, 2, 5, 5, 5, 3, 3)	**2.4** (2, 3, 2, 3, 2, 2, 2, 1, 2, 5, 2, 3)
	Vance	1	**3.3** (4, 3, 5, 2, 3, 3)	**2.5** (4, 3, 2, 2, 1, 3)
	Woodstock	1	**3.2** (3, 5, 2, 3, 3)	**2.2** (3, 2, 2, 1, 3)
	AVERAGE		**3.3**	**2.4**
Winter Storms/ Freezes	Tuscaloosa County	1	**3** (4, 1, 2, 4, 2, 2, 5, 5, 3, 2)	**3** (3, 4, 2, 3, 4, 2, 3, 5, 2, 2)
	Brookwood	1	**3.4** (2, 5, 5, 3, 2)	**2.2** (2, 3, 2, 2, 2)
	Coaling	1	**3.4** (2, 5, 5, 3, 2)	**2** (2, 3, 2, 1, 2)
	Coker	1	**3.4** (2, 5, 5, 3, 2)	**2** (2, 3, 2, 1, 2)
	Lake View	1	**3.4** (2, 5, 5, 3, 2)	**2.4** (2, 3, 2, 3, 2)
	Moundville	1	**3.4** (2, 5, 5, 3, 2)	**2** (2, 3, 2, 1, 2)

Hazard	Geographic Area	Location (2014)	Probability (2014) *	Extent (2014) *
	Northport	1	**3** (3, 2, 2, 4, 2, 5, 5, 3, 2, 2)	**2.5** (2, 2, 2, 4, 2, 3, 4, 2, 2, 2)
	Tuscaloosa	1	**2.7** (2, 2, 1, 4, 2, 1, 1, 4, 5, 5, 3, 2)	**3.1** (2, 5, 4, 5, 2, 2, 1, 4, 3, 5, 2, 2)
	Vance	1	**3.2** (2, 2, 5, 5, 3, 2)	**2.5** (3, 2, 3, 2, 3, 2)
	Woodstock	1	**3.4** (2, 5, 5, 3, 2)	**2.4** (2, 3, 2, 3, 2)
	AVERAGE		**3.2**	**2.4**
Hurricanes	Tuscaloosa County	1	**2.6** (3, 1, 2, 2, 2, 2, 5, 5, 2, 2)	**2.8** (3, 3, 2, 3, 3, 3, 3, 5, 1, 2)
	Brookwood	1	**3.2** (2, 5, 5, 2, 2)	**2.8** (3, 3, 5, 1, 2)
	Coaling	1	**3.2** (2, 5, 5, 2, 2)	**2.4** (3, 3, 3, 1, 2)
	Coker	1	**3.2** (2, 5, 5, 2, 2)	**2.4** (3, 3, 3, 1, 2)
	Lake View	1	**3.2** (2, 5, 5, 2, 2)	**2.4** (3, 3, 3, 1, 2)
	Moundville	1	**3.2** (2, 5, 5, 2, 2)	**2.4** (3, 3, 3, 1, 2)
	Northport	1	**2.5** (1, 1, 2, 3, 2, 5, 5, 2, 2, 2)	**2.1** (1, 1, 2, 2, 3, 3, 4, 1, 2, 2)
	Tuscaloosa	1	**2.5** (2, 2, 1, 2, 2, 1, 3, 5, 5, 2, 2)	**2.5** (1, 4, 3, 2, 4, 1, 2, 3, 5, 1, 2)
	Vance	1	**3** (2, 2, 5, 5, 2, 2)	**2.5** (3, 3, 3, 3, 1, 2)
	Woodstock	1	**3.2** (2, 5, 5, 2, 2)	**2.4** (3, 3, 3, 1, 2)
	AVERAGE		**3.0**	**2.5**
Droughts/Heat Waves	Tuscaloosa County	1	**2.9** (3, 2, 3, 2, 3, 2, 4, 5, 3, 2)	**2.4** (2, 2, 2, 2, 4, 2, 2, 5, 1, 2)
	Brookwood	1	**3.5** (2, 4, 5, 3)	**2** (2, 2, 3, 1)
	Coaling	1	**3.5** (2, 4, 5, 3)	**2** (2, 2, 3, 1)
	Coker	1	**3.5** (2, 4, 5, 3)	**2** (2, 2, 3, 1)

Hazard	Geographic Area	Location (2014)	Probability (2014) *	Extent (2014) *
	Lake View	1	**3.5** (2, 4, 5, 3)	**2** (2, 2, 3, 1)
	Moundville	1	**3.5** (2, 4, 5, 3)	**2** (2, 2, 3, 1)
	Northport	1	**3** (2, 1, 3, 3, 2, 4, 5, 3, 4)	**1.9** (2, 1, 2, 1, 2, 2, 4, 1, 2)
	Tuscaloosa	1	**2.8** (3, 1, 2, 3, 1, 3, 3, 4, 5, 3)	**2.2** (2, 3, 2, 2, 1, 3, 1, 2, 5, 1)
	Vance	1	**3.2** (2, 2, 4, 5, 3)	**2.2** (3, 2, 2, 3, 1)
	Woodstock	1	**3.5** (2, 4, 5, 3)	**2** (2, 2, 3, 1)
	AVERAGE		**3.3**	**2.1**
Wildfires	Tuscaloosa County	1	**3** (3, 2, 2, 2, 5, 3, 2, 5, 3)	**2.6** (2, 4, 3, 1, 3, 2, 2, 5, 1)
	Brookwood	1	**3.3** (3, 2, 5, 3)	**2.3** (2, 2, 4, 1)
	Coaling	1	**2.6** (3, 2, 5, 1, 2)	**2.2** (2, 2, 4, 1, 2)
	Coker	1	**2.8** (3, 2, 5, 1)	**2.3** (2, 2, 4, 1)
	Lake View	1	**3.3** (3, 2, 5, 3)	**2.5** (3, 2, 4, 1)
	Moundville	1	**3.3** (3, 2, 5, 3)	**2** (2, 2, 3, 1)
	Northport	1	**2.1** (2, 1, 1, 2, 3, 2, 5, 1, 2)	**1.6** (2, 1, 1, 1, 2, 2, 2, 1, 2)
	Tuscaloosa	1	**2.2** (1, 2, 2, 2, 1, 2, 4, 2, 2, 5, 1)	**2.2** (1, 2, 4, 3, 1, 4, 3, 1, 2, 2, 1)
	Vance	1	**3** (2, 3, 2, 5, 3)	**2.4** (3, 2, 2, 4, 1)
	Woodstock	1	**3.3** (3, 2, 5, 3)	**2.5** (3, 2, 4, 1)
	AVERAGE		**2.9**	**2.3**
Dam/levee failures	Tuscaloosa County	1	**1.9** (2, 1, 1, 1, 2, 2, 2, 5, 1, 2)	**2.9** (5, 5, 1, 1, 3, 2, 4, 3, 1, 4)
	Brookwood	1	**1.7** (2, 2, 1)	**2.3** (2, 4, 1)

Hazard	Geographic Area	Location (2014)	Probability (2014) *	Extent (2014) *
	Coaling	1	**1.3** (1, 2, 1)	**2** (1, 4, 1)
	Coker	1	**1.3** (1, 2, 1)	**2** (1, 4, 1)
	Lake View	1	**2** (1, 2, 3)	**2** (1, 4, 1)
	Moundville	1	**3** (2, 2, 5, 3)	**3** (2, 4, 3, 3)
	Northport	1	**2.2** (2, 3, 1, 1, 2, 2, 5, 3, 1)	**2.9** (3, 5, 1, 4, 2, 4, 3, 3, 1)
	Tuscaloosa	1	**1.7** (2, 1, 1, 1, 1, 1, 1, 1, 2, 5, 3)	**3.4** (2, 2, 5, 5, 1, 5, 5, 4, 4, 3, 1)
	Vance	1	**1.3** (1, 2, 1)	**2** (1, 4, 1)
	Woodstock	1	**1.3** (1, 2, 1)	**2** (1, 4, 1)
	AVERAGE		**1.8**	**2.5**
Landslides	Tuscaloosa County	1	**1.8** (3, 1, 1, 4, 2, 1, 1, 3, 1, 1)	**1.4** (2, 1, 1, 2, 2, 1, 1, 2, 1, 1)
	Brookwood	1	**1.8** (1, 1, 3, 2)	**1.5** (1, 1, 2, 2)
	Coaling	1	**1**	**1**
	Coker	1	**1**	**1**
	Lake View	1	**1**	**1**
	Moundville	1	**1.7** (1, 1, 3)	**1.3** (1, 1, 2)
	Northport	1	**1**	**1**
	Tuscaloosa	1	**1**	**1**
	Vance	1	**1**	**1**
	Woodstock	1	**1**	**1**
	AVERAGE		**1.2**	**1.1**

Hazard	Geographic Area	Location (2014)	Probability (2014) *	Extent (2014) *
Earthquakes	Tuscaloosa County	1	**1.5** (2, 1, 1, 1, 2, 1, 1, 3, 1, 1)	**1.7** (2, 2, 1, 1, 3, 3, 2, 1, 1, 1)
	Brookwood	1	**1.5** (1, 1, 3, 1)	**1.8** (3, 2, 1, 1)
	Coaling	1	**1.5** (1, 1, 3, 1)	**1.8** (3, 2, 1, 1)
	Coker	1	**1.5** (1, 1, 3, 1)	**1.8** (3, 2, 1, 1)
	Lake View	1	**1.5** (1, 1, 3, 1)	**1.8** (3, 2, 1, 1)
	Moundville	1	**1.5** (1, 1, 3, 1)	**1.8** (3, 2, 1, 1)
	Northport	1	**1**	**1.4** (1, 2, 1, 1, 3, 2, 1, 1, 1)
	Tuscaloosa	1	**1.3** (1, 1, 1, 1, 1, 2, 1, 1, 1, 3, 1)	**1.5** (1, 1, 2, 3, 1, 2, 1, 1, 2, 1, 1)
	Vance	1	**1.6** (2, 1, 1, 3, 1)	**2.2** (4, 3, 2, 1, 1)
	Woodstock	1	**1.5** (1, 1, 3, 1)	**1.8** (3, 2, 1, 1)
	AVERAGE		**1.4**	**1.8**
Sinkholes	Tuscaloosa County	1	**1.9** (2, 1, 2, 2, 3, 2, 1, 2, 2)	**1.7** (2, 1, 2, 2, 2, 2, 1, 1, 2)
	Brookwood	1	**1.5** (2, 1, 2, 1)	**1.3** (2, 1, 1, 1)
	Coaling	1	**1.7** (2, 1, 2)	**1**
	Coker	1	**1.7** (2, 1, 2)	**1**
	Lake View	1	**1.6** (2, 1, 2, 1, 2)	**1.4** (2, 1, 1, 1, 2)
	Moundville	1	**1.7** (2, 1, 2)	**1**
	Northport	1	**1.4** (1, 1, 2, 1, 2, 1, 2, 1)	**1.3** (1, 1, 2, 1, 2, 1, 1, 1)
	Tuscaloosa	1	**1.3** (1, 1, 1, 2, 2, 1, 1, 1, 1, 2)	**1.4** (1, 1, 1, 2, 2, 3, 1, 1, 1, 1)
	Vance	1	**1.8** (2, 2, 1, 2)	**1.5** (3, 1, 1, 1)

Hazard	Geographic Area	Location (2014)	Probability (2014) *	Extent (2014) *
	Woodstock	1	**1.5** (2, 1, 2, 1)	**1**
	AVERAGE		**1.6**	**1.3**
Manmade and Technological	Tuscaloosa County	1	**2.8** (5, 2, 2, 2, 3, 3, 3, 5, 1, 2)	**2.8** (2, 4, 3, 1, 4, 3, 3, 5, 1, 2)
	Brookwood	1	**2.8** (2, 3, 4, 2)	**3** (3, 3, 4, 2)
	Coaling	1	**2.3** (1, 3, 4, 1)	**2.3** (1, 3, 4, 1)
	Coker	1	**2.3** (1, 3, 4, 1)	**2.3** (1, 3, 4, 1)
	Lake View	1	**2.3** (1, 3, 4, 1)	**2.3** (1, 3, 4, 1)
	Moundville	1	**2.3** (1, 3, 4, 1)	**2.3** (1, 3, 4, 1)
	Northport	1	**2.9** (2, 4, 2, 4, 2, 3, 5, 3, 1)	**3.3** (2, 5, 3, 3, 3, 3, 5, 2, 3)
	Tuscaloosa	1	**2.8** (1, 2, 2, 2, 2, 2, 5, 4, 3, 5, 3)	**3.9** (3, 5, 4, 5, 3, 5, 5, 3, 3, 5, 2)
	Vance	1	**2.8** (4, 1, 3, 4, 2)	**3** (5, 1, 3, 4, 2)
	Woodstock	1	**2.3** (1, 3, 4, 1)	**2.3** (1, 3, 4, 1)
	AVERAGE		**2.6**	**2.8**

**The average responses for each jurisdiction is followed by individual responses in parenthesis.*

2.0 Hazard Descriptions

2.1 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 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.

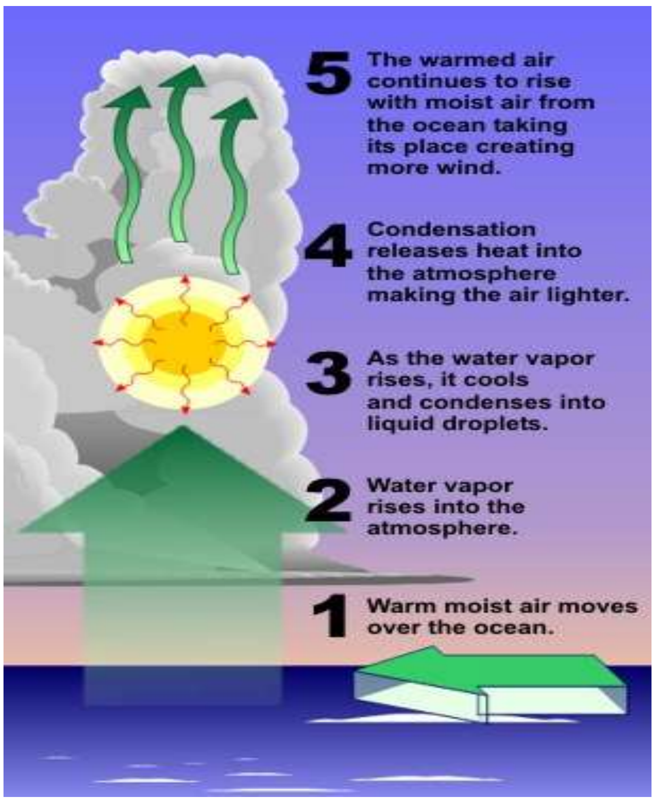


Figure D-1. How a Hurricane Forms
Source: National Hurricane Center (www.nhc.noaa.gov

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 of 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-2. 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

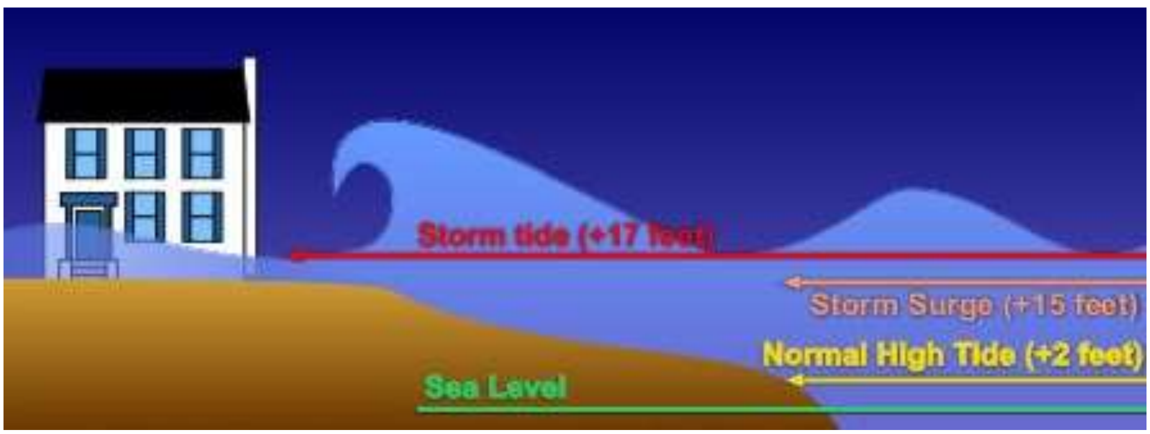
The main parts of a hurricane are the eye, the eye wall, and rain bands. The **eye** of a hurricane is the calmest part. The eye is typically 20-40 miles across and has light winds that don't exceed 15 mph. An eye will usually develop when the maximum sustained wind speed is more than 74 mph. The strong rotation around the cyclone balances inflow to the center, causing air to ascend about 10-20 miles from the center forming the eye wall. 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 eye wall 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 eye wall winds return in an opposite direction.

The **eye wall** is the part of a hurricane where the strong winds meet the eye. The eye wall 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 eye wall 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 eye walls can form.

The **rain bands** are the outermost part of the hurricane. They are bands of clouds and thunderstorms that trail away from the eye wall in a spiral fashion. These bands produce heavy rain and strong winds, as well as potentially 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-2. 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 may 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).

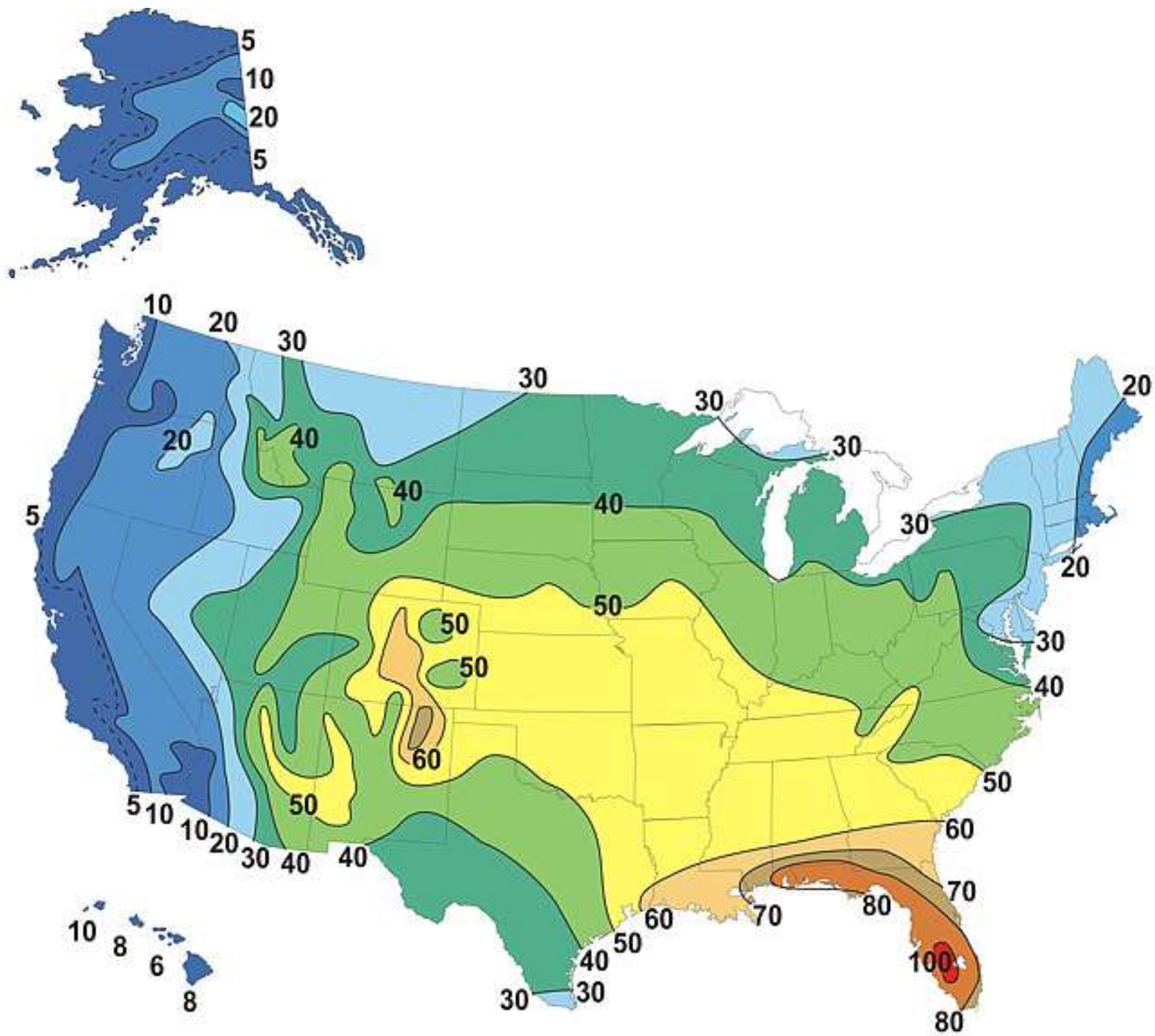
2.2 Severe Storms Description

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.

Thunderstorms 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.

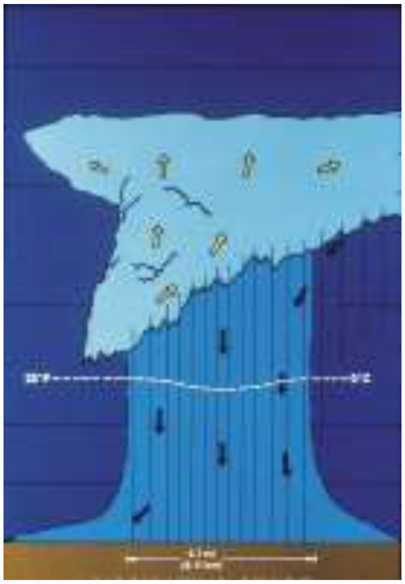
The National Weather Service estimates over 40,000 thunderstorms occur each day worldwide or close to 16 million annually. In the U.S., roughly 100,000 thunderstorms occur each year. The following map shows the average number of thunderstorm days each year throughout the U.S. The most frequent occurrence 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 the 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



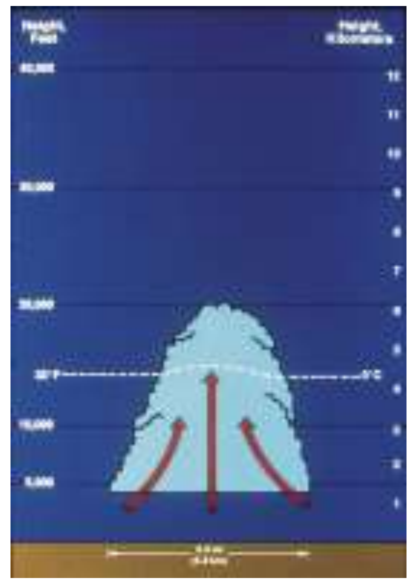
Source: National Weather Service

Figure D-3. Life Cycle of a Thunderstorm



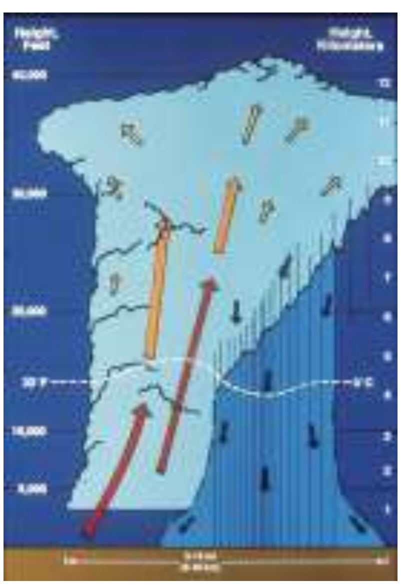
Developing Stage

- 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.



Dissipating Stage

- Rainfall decreases in intensity.
- Can still produce a burst of strong winds.
- Lightning remains a danger

Source: National Weather Service

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.
- Lightning starts many fires in the western United States and Alaska.
- 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.

Another damaging effect of severe storms is **hail**. 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. Ice particles 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.

Figure D-4. Hail Stones.

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.

(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/).

2.3 Tornadoes Description

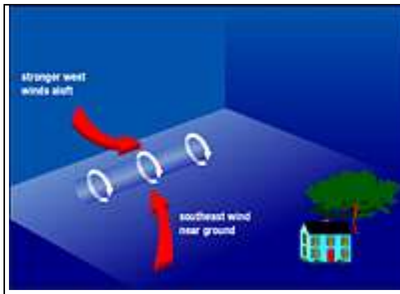
Tornadoes are one of nature's most violent storms, which are characterized by a rapidly rotating column of air extending from the base of a thunderstorm to the ground. In an average year, approximately 1,000 tornadoes are reported across the United States, resulting in over 1,500 injuries and 80 deaths, 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.

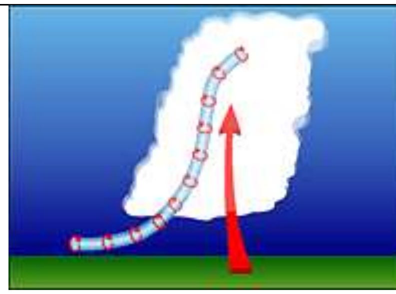
Tornadoes can occur in thunderstorms that develop in warm, moist air masses in advance of eastward-moving cold fronts. These thunderstorms often produce large hail and strong winds, in addition to tornadoes. Thunderstorms spawn tornadoes when cold air overrides a layer of warm air, causing the warm air 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:

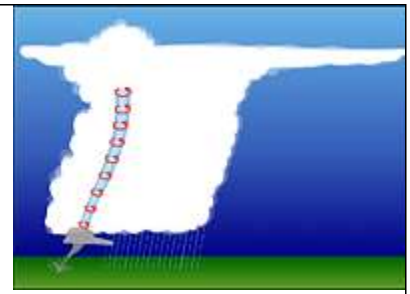
Figure D-5. How a Tornado Forms



▲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	4D-78	0	6D-85	**0**	**6D-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.
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).

2.4 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, 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 D-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.

Table D-5. Flood Zone Designations

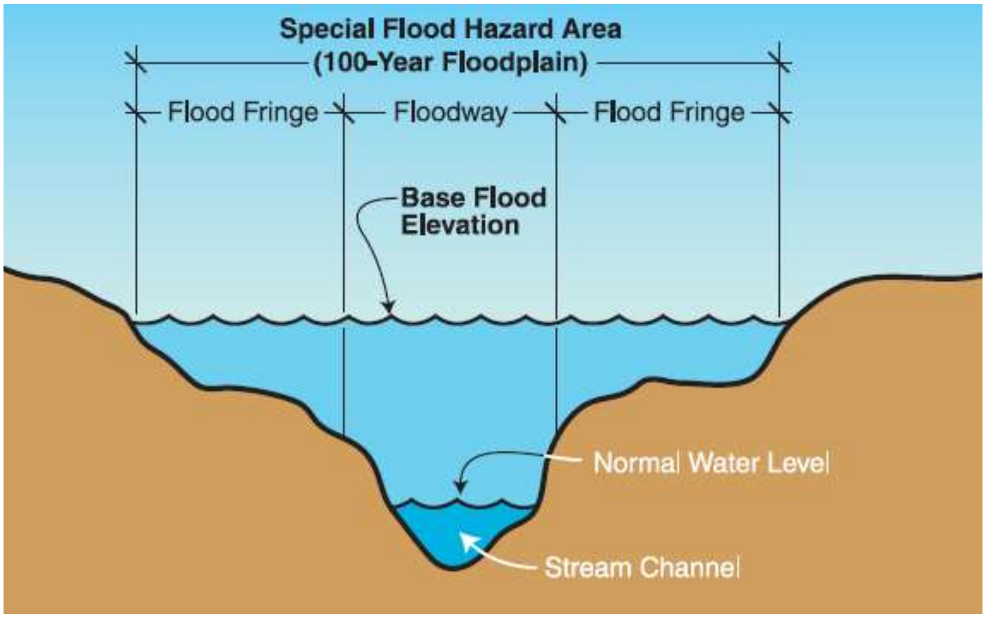
A Zones	100-year floodplain areas of high risk.	
	A	The base floodplain mapped by approximate methods. (i.e., BFEs are not determined). This is often called an unnumbered A zone or an approximate A zone.
	AE	The base floodplain where base flood elevations are provided.
	AO	The base floodplain with sheet 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

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-6. Flood Plain Cross Section



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 shoreline, 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).

2.5 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 natural causes, primarily lightning, other natural causes include sparks from falling rocks and volcanic activity. 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.

Most wildfires fall within two categories: Wildland Fire and Wildland-Urban Interface fires. **Wildland fires** occur in areas where there is little development except for roads, railroads, power lines and other basic infrastructure. **Wildland-urban interface fires** occur in areas where development, primarily residential, meets wildland areas. Areas with a large amount of wooded, brush and grassy areas are at highest risk from wildfires.

The primary cause of wildfires is human activity, either intentional or accidental. Intentional fires may be started as prescribed burns, to drive game or arson. Accidental fires are caused by the carelessness of hikers or others traveling through wildland areas. The severity and duration of the fire is based upon numerous factors including available fuel, topography and weather conditions. Through efforts of the Alabama Forestry Commission, wildfires are decreasing. They have a fleet of airplanes available to patrol vulnerable areas. There is also a toll-free number in place for the public to call and report wildfires. The forestry commission does have firefighters available to respond to fires, but the effort is largely accomplished through a network of volunteer fire departments.

(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).

2.6 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 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. "D0" includes drought watch areas that are abnormally dry and on the verge of drought or recovering from drought. "D1" is the first drought stage with severe conditions, and "D4" is most intense drought stage with exceptional drought conditions. 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 issues 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 Fahrenheit and is a measure of how hot it really feels when the relative humidity is added to the actual air temperature.

Table D-6. 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).

2.7 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).

2.8 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, sinkholes, and landslides.

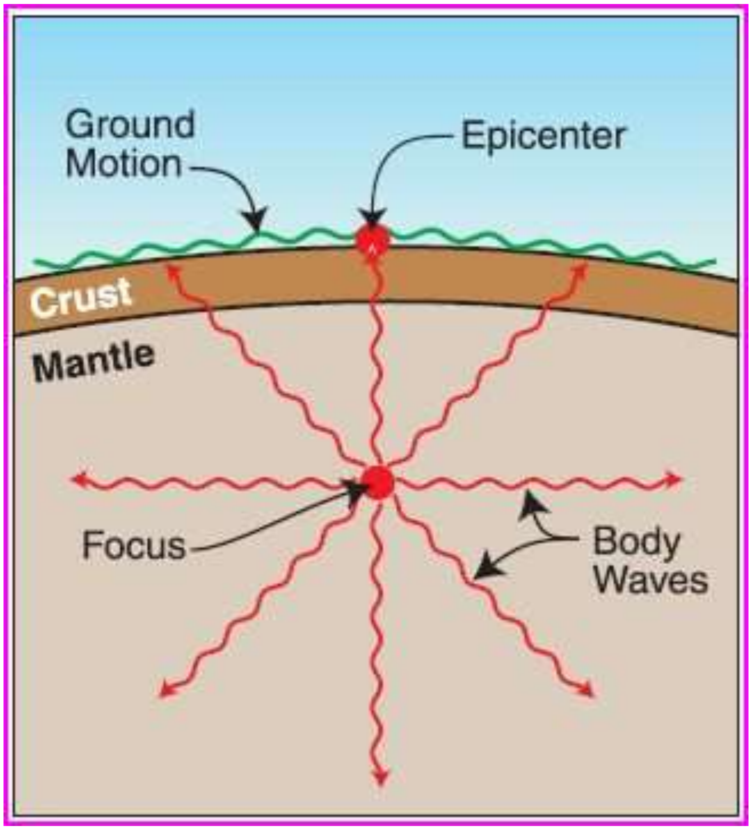
The rupture or sudden movement of a fault causes earthquakes where stresses have accumulated along opposing fault planes of the earth's outer crust. These fault planes are usually found along the borders of the earth's tectonic plates, which generally follow the outlines of the continents. However, fault planes may occur at the interior of the plates. The plates range from 50 to 60 miles in thickness and move slowly and continuously over the earth's interior. Where the plates move past each other, they continually bump, slide, catch, and hold. When the stress exceeds the elastic limit of the rock, an earthquake occurs. Generally, the larger the earthquake, the greater the potential for surface fault rupture.

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. Areas prone to earthquakes are relatively easy to identify in the Western United States based on known geologic formations; however, predicting exactly when and where earthquakes will occur is very difficult everywhere. Records show that building inventories in 39 states are vulnerable to earthquake damage.

Most property damage and earthquake-related deaths result from the failure and collapse of structures caused by **ground shaking or ground motion**. Ground shaking is the motion felt on the earth's surface caused by seismic waves generated by an earthquake. The strength of the ground shaking is determined by the magnitude of the earthquake, the surface distance from the earthquake's epicenter and type of fault, and by the site and regional geology.

Ground shaking causes waves in the earth's interior, known as **seismic waves**, and along the earth's surface, known as **surface waves**. There are two types of seismic waves: *primary waves* which are longitudinal that cause back-and-forth oscillation along the direction of travel (vertical motion); and *secondary waves or shear waves* which are slower than primary waves and cause structures to vibrate from side-to-side (horizontal motion). Surface waves travel more slowly than and are usually significantly less damaging than seismic waves, illustrated by Figure D-8, below.

Figure D-8. Seismic and Surface Waves



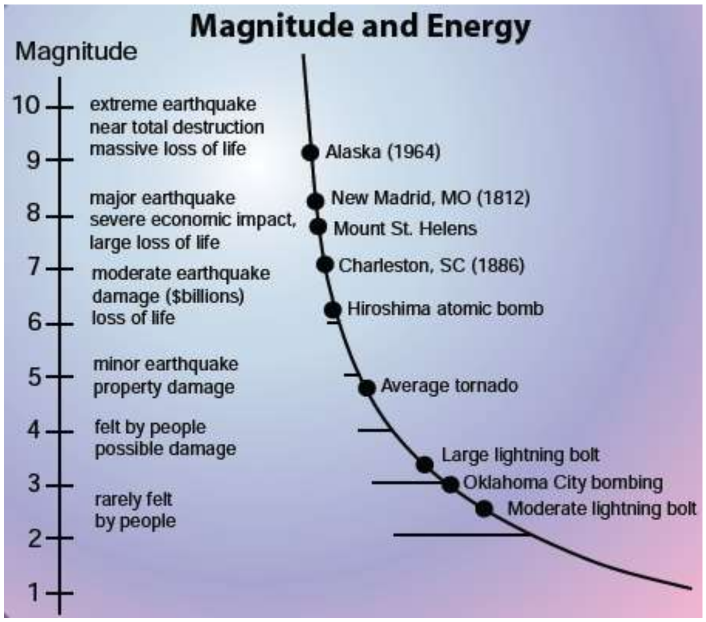
Source: FEMA

Additional earthquake related hazards include landslides, liquefaction, and amplification. Earthquake-induced **landslides** are secondary earthquake hazards that occur from ground shaking. 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 of soft soils, which includes fill, loose sand, waterfront, and lakebed clays. 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. Geologists use other measures of magnitude and intensity such as Moment Magnitude, Energy Magnitude and others as described at http://neic.usgs.gov/neis/phase_data/mag_formulas.html.

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**. It was developed in 1931 by the American seismologists Harry Wood and Frank Neumann. 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 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 an arbitrary ranking based on observed effects. Table D-7 compares the Modified Mercalli Intensity scale with the Richter scale.

Table D-7. Earthquake Scales Comparison

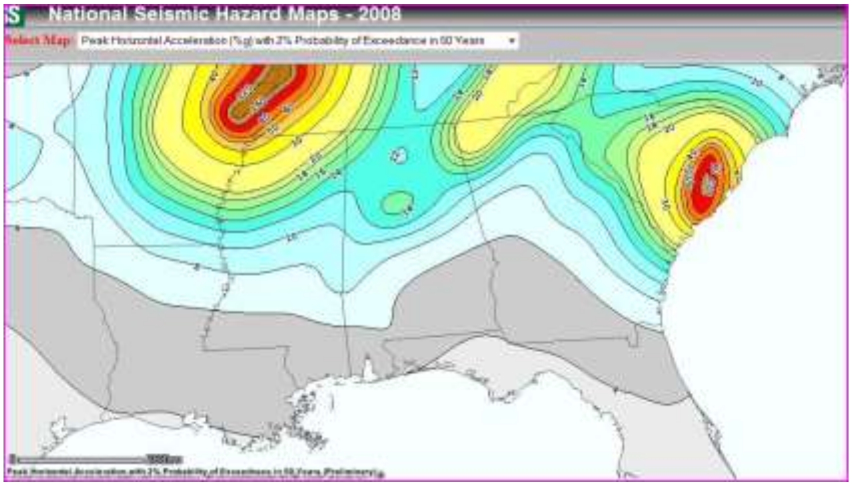
Modified Mercalli Intensity and Richter Scale Comparison			
SCALE	**INTENSITY**	**DESCRIPTION OF EFFECTS**	**CORRESPONDING RICHTER SCALE MAGNITUDE**
I	Instrumental	Detected only on seismographs	
II	Feeble	Some people feel it	<4.2
III	Slight	Felt by people resting; like a truck rumbling by	
IV	Moderate	Felt by people walking	
V	Slightly Strong	Sleepers awake; church bells ring	<4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves	<5.4
VII	Very Strong	Mild Alarm; walls crack; plaster falls	<6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open	<6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread	<7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards	<8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves	>8.1

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 shows the 2008 Peak Ground Acceleration (PGA) values for the southeastern 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 areas shown in color), the probability of an earthquake at each given level of severity, and the severity (the PGA is indicated by color).

Map D-2. 2008 PGA for Southeast
Peak Ground Acceleration with 2% Probability of Exceedance in 50 Years



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 <u>Understanding Your Risks</u> (FEMA 386-2), August 2001, <u>Using HAZUS-MH for Risk Assessment</u> How to Guide (FEMA 433), August 2004, 2007 <u>Alabama State Hazard Mitigation Plan</u>, U.S. Geological Survey Earthquakes Hazard Program, and various FEMA-adopted plans).

2.9 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, and Dam Failure at http://www.fema.gov/hazard/damfailure/index.shtm).

2.10 Landslides Description

Landslides occur and can cause damage in all 50 States, at an annual cost of about $3.5 billion per year (*FEMA 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 man-made 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. Man-made 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 three different types of landslides: rock falls, slides, and flows. **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:

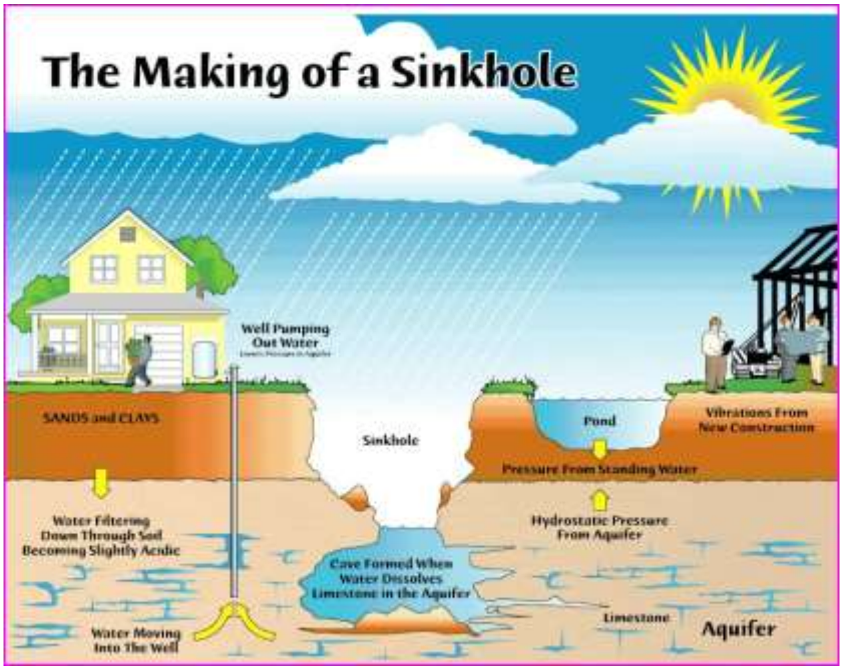
- *Landslides often accompany earthquakes, floods, storm surges, hurricanes, wildfires, or volcanic activity. They are often more damaging and deadly than the triggering event (examples: the 1964 Alaska earthquake-induced landslides and the 1980 Mount St. Helens volcanic debris flow).*
- *Human activities 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).

2.11 Sinkholes (Land Subsidence) Description

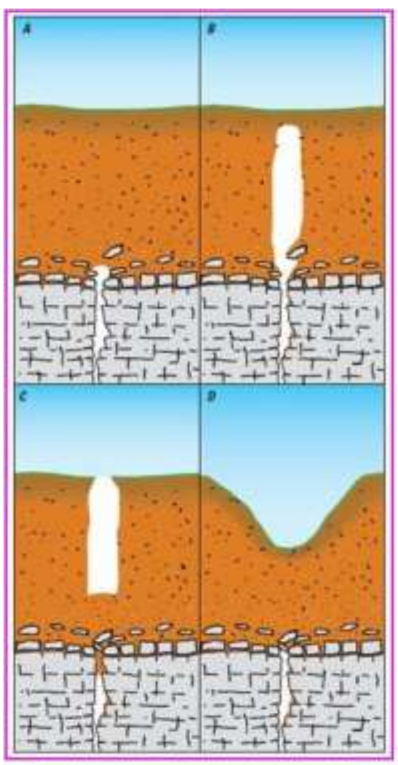
Sinkholes are a naturally occurring geologic feature that can be hazardous to property and the environment. Their formation is due to water dissolving rock below the land surface. The types of rock most susceptible to sinkhole formation are salt and carbonate rocks such as limestone, dolomite, and marble. 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).

2.12 Manmade and Technological Hazards Description

Manmade and technological hazards are hazards that originate from human activity. The two categories of manmade 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.

Manmade 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 manmade 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 manmade 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 manmade 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 manmade 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 manmade 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-8 “Event Profiles for Terrorism and Technological Hazards,” (from the FEMA “How to Guide” for manmade and technological hazards) explains the ways in which manmade 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-8. Event Profiles for Terrorism and Technological Hazards

Manmade Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
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.

Manmade 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.

Manmade Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
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.
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.
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.

Manmade Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
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.
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.

Manmade Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
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.
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 Manmade Hazards into Mitigation Planning, FEMA 386-7 Version 2.0, FEMA, September 2003).

Appendix E
Hazard Profile Data

App. E - Hazard Profile Data

1.0 Records of Previous Occurrences of Hazard Events

This appendix contains the detailed records of previous occurrences of hazard events reported in Section 5.4 "Hazard Profiles," for events reported by the National Weather Service and National Climatic Data Center.

Past Occurrences of Tornadoes

Table E-1. Tuscaloosa Tornadoes, 1996-2013 (NCDC)

44 TORNADO(s) were reported in **Tuscaloosa County, Alabama** between **01/01/1996** and **12/31/2013**.
*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:					56	964	1.542B	612.00K
TUSCALOOSA	1/24/1997	17:00	Tornado	F2	1	10	5.000M	5.00K
COKER	1/28/1997	0:08	Tornado	F2	0	1	85.00K	2.00K
HOLMAN	4/8/1998	18:05	Tornado	F3	0	1	800.00K	0.00K
BROOKWOOD	4/8/1998	18:42	Tornado	F5	0	1	30.00K	600.00K
HOLMAN	5/9/1998	18:26	Tornado	F0	0	0	15.00K	5.00K
FOSTERS	3/10/2000	20:15	Tornado	F0	0	0	50.00K	0.00K
NORTHPORT	3/10/2000	20:28	Tornado	F0	0	0	15.00K	0.00K
KELLERMAN	4/3/2000	11:20	Tornado	F2	0	0	15.00K	0.00K
HULL	12/16/2000	12:54	Tornado	F4	11	144	12.500M	0.00K
SAMANTHA	11/24/2001	11:39	Tornado	F1	0	0	25.00K	0.00K
ABERNANT	11/24/2001	12:37	Tornado	F0	0	0	1.00K	0.00K
ABERNANT	11/10/2002	22:22	Tornado	F2	0	3	300.00K	0.00K
TUSCALOOSA	11/18/2003	11:47	Tornado	F1	0	2	100.00K	0.00K
NORTHPORT	4/30/2005	3:16	Tornado	F0	0	0	95.00K	0.00K
ECHOLA	9/25/2005	13:55	Tornado	F0	0	0	35.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
SAMANTHA	9/25/2005	14:05	Tornado	F0	0	0	17.00K	0.00K
ELROD	9/25/2005	14:55	Tornado	F1	0	0	14.00K	0.00K
ELROD	9/25/2005	14:55	Tornado	F0	0	0	0.00K	0.00K
BUHL	9/25/2005	15:05	Tornado	F1	0	2	250.00K	0.00K
BUHL	9/25/2005	15:19	Tornado	F0	0	0	20.00K	0.00K
SAMANTHA	9/25/2005	15:24	Tornado	F0	0	0	9.00K	0.00K
BUHL	9/25/2005	16:52	Tornado	F0	0	0	60.00K	0.00K
BUHL	9/25/2005	16:59	Tornado	F1	0	0	200.00K	0.00K
COKER	9/25/2005	17:14	Tornado	F0	0	0	0.00K	0.00K
SAMANTHA	3/13/2006	17:43	Tornado	F0	0	0	2.00K	0.00K
SAMANTHA	3/13/2006	17:54	Tornado	F0	0	0	0.00K	0.00K
HAGLER	2/13/2007	17:10	Tornado	EF1	0	0	100.00K	0.00K
SAMANTHA	3/1/2007	15:00	Tornado	EF1	0	0	50.00K	0.00K
ECHOLA	1/10/2008	15:45	Tornado	EF0	0	0	5.00K	0.00K
STERLING	1/10/2008	16:11	Tornado	EF3	0	0	435.00K	0.00K
NEW LEXINGTON	2/6/2008	2:58	Tornado	EF1	0	0	25.00K	0.00K
SAMANTHA	3/4/2008	0:50	Tornado	EF1	0	0	50.00K	0.00K
SAMANTHA	4/2/2009	14:43	Tornado	EF1	0	0	5.00K	0.00K
SAMANTHA	5/6/2009	7:48	Tornado	EF1	0	0	65.00K	0.00K
SHIRLEY	5/6/2009	7:57	Tornado	EF1	0	0	100.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
RALPH	4/15/2011	14:16	Tornado	EF3	0	0	7.060M	0.00K
HOLMAN	4/27/2011	3:44	Tornado	EF3	0	0	730.00K	0.00K
COALING	4/27/2011	4:17	Tornado	EF3	0	0	9.200M	0.00K
MOORES BRIDGE	4/27/2011	15:06	Tornado	EF3	0	0	2.000M	0.00K
NEW LEXINGTON	4/27/2011	15:18	Tornado	EF2	0	0	2.500M	0.00K
RALPH	4/27/2011	15:48	Tornado	EF4	44	800	1.500B	0.00K
SHIRLEY	1/23/2012	2:42	Tornado	EF2	0	0	0.00K	0.00K
BURCHFIELD	1/23/2012	3:00	Tornado	EF2	0	0	0.00K	0.00K
KELLERMAN	1/23/2012	3:09	Tornado	EF1	0	0	0.00K	0.00K
Totals:					56	964	1.542B	612.00K

Source: National Climatic Data Center

Table E-2. Tuscaloosa County Tornadoes, 1900-2013 (NWS)

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
1904	1	22	20	Hale-Tuscaloosa Storm Report	F4	15	300	36	150	2 SW Moundville- 3.4 SW Cottondale The northern half of the town was leveled and half of the population was killed or injured. One death occurred at Hull where 4 homes, a lumber mill, and a church were destroyed. Approximate Location
1917	5	28	10	Tuscaloosa-Bibb	F2	18	300	1	10	SE Tuscaloosa-Woodstock 15 homes were destroyed and a woman was killed in a horse stable.
1917	5	27	2235	Tuscaloosa	F3	5	500	5	10	Windham Springs At least 24 homes were damaged or destroyed. 5 people were killed in three homes.
1921	4	16	730	Greene-Tuscaloosa	F3	20	800	4	40	3 SW Ralph-Northport 30 buildings were destroyed in Ralph. 4 people died in 3 different homes. Thousands of trees were blown down along the path.
1929	3	23	515	Tuscaloosa	F2	1	200	0	0	Tuscaloosa Homes were unroofed and trees were snapped off on the south side of the city.
1932	3	21	1600	Tuscaloosa Storm Report	F4	20	400	37	200	Ralph-Tuscaloosa-Northport 100 homes were destroyed and 300 were damaged.
1932	1	12	1715	Hale-	F3	8	400	9	29	Moundville

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
				Tuscaloosa						At least 30 homes were severely damaged or destroyed. The Moundville elementary school was heavily damaged. Deaths occurred in at least 5 different homes. In the Guinea community just south of Moundville, 9 people were killed and a number of dwellings were destroyed.
1936	12	6	1330	Tuscaloosa	F3	15	100	0	25	11.0 NW Tuscaloosa Three large homes and eight small homes were demolished.
1939	4	17	200	Tuscaloosa	F2	10	0	0	2	5.0 W Northport-3.0 NW Northport At least 12 farms were damaged and at least one home was destroyed.
1939	1	29	1630	Tuscaloosa	F2	6	200	0	11	Coker One school was leveled. Five people were injured in one home and six in another. Trees were blown down for miles.
1952	2	13	2000	Fayette-Tuscaloosa	F3	5.6	100	1	14	New Lexington - 4 SE Bankston At least 2 homes were destroyed and 7 homes were damaged around the New Lexington area. 8 homes were damaged or destroyed n Fayette County.
1957	11	18	1445	Tuscaloosa	F1	3.3	10	0	1	12 N Tuscaloosa At least 7 homes suffered major damage and several automobiles were destroyed.
1961	2	22	530	Tuscaloosa	F2	0.1	10	0	0	Tuscaloosa

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										The tornado touched down on the eastern side of town. Several warehouses were damaged on Northington Campus, then moved NE across residential area to Parlow State School grounds. Several homes were damaged and many trees were blown down or broken off.
1966	3	3	1930	Pickens-Tuscaloosa	F5 (F5)	66.5 -202.5	900 -900	1 -58	27 -518	3.5 NW Panola-Vienna-Benevola-Near Buhl-20 NE Tuscaloosa 20 houses and 6 barns were destroyed. 20 homes and 15 barns were damaged. Crop losses were mainly to timber.
1974	4	3	1735	Pickens-Tuscaloosa-Fayette-Walker-Cullman	F4	110.6	500	3	178	Aliceville-Jasper-5.1 NW Holly Pond Downtown Jasper was hardest hit area. Numerous stores/commercial buildings damaged and several destroyed. The Walker County courthouse was severely damaged and the fire station was demolished. Along the entire path, 500 buildings were destroyed and 381 were severely damaged. 56 mobile homes destroyed with 13 having major damage. One killed in Cullman and 2 others in Berry, Fayette Co. There were 36 injuries in Cullman Co. and 102 in Walker Co.
1974	4	1	1705	Tuscaloosa	F2	16.3	800	0	6	Moores Bridge-Samantha Widespread damage along the path. All injuries were minor.

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
1974	3	29	13	Tuscaloosa	F0	0.1	20	0	0	10 WNW Tuscaloosa Tuscaloosa Police reported brief touchdown near U.S. Highway 82. No significant damage.
1975	3	18	1720	Tuscaloosa	F1	2	50	0	0	Tuscaloosa Several homes damaged in the Hillsdale and Arcadia subdivisions.
1975	3	13	1445	Tuscaloosa	F0	0.5	50	0	0	Tuscaloosa Trees and powerlines were blown down.
1975	2	23	1345	Tuscaloosa	F4	14.4	500	1	49	Taylorville-Holt Small frame homes were leveled across south Tuscaloosa. Over the entire path, 289 homes, 20 businesses, and 21 trailers were destroyed or heavily damaged.
1975	1	10	1430	Tuscaloosa	F1	0.1	10	0	0	Brookwood Tornado touched down destroying a mobile home and damaging several other homes and buildings. Heavy timber damage also occurred with trees twisted or snapped in two. Tornado was accompanied by a loud roar as it moved northeast.
1977	9	6	1505	Tuscaloosa Hurricane Babe Information	F1	0.2	77	0	0	Windham Springs Two small barns destroyed and 1 home damaged.
1977	9	6	1400	Tuscaloosa	F2	8.3	100	0	0	Cottondale-Holt

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
				Hurricane Babe Information						Some uprooted trees and damage to outbuildings occurred at Cottondale and Holt. A dock at the North River Yacht Club was destroyed and several boats were damaged. The tornado moved NW.
1978	12	8	1606	Tuscaloosa	F0	0.3	20	0	0	Moody Swamp Little or no damage reported.
1978	12	8	1555	Tuscaloosa	F1	2.5	50	0	0	Brownville A church and Sunday School building were damaged.
1983	12	11	1845	Tuscaloosa	F1	0.5	127	0	0	6 NW Northport A mobile home, barn and a garage were damaged and trees were snapped off. Golf ball size hail was also reported.
1983	12	3	1605	Tuscaloosa	F1	0.1	30	0	0	9 N Northport An empty school bus was blown 40 yards. There were several witnesses.
1983	11	15	130	Tuscaloosa	F2	0.2	40	0	0	Antioch One home hasd roof and foundation damage, 1 mobile home was destroyed, and a 1982 station wagon lifted up and moved some 30 feet. Another home some 300 yards away was less severely damaged.
1984	11	10	1306	Pickens-	F2	14	400	0	0	SW Elrod-Northport

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
				Tuscaloosa						At least 50 homes and farm structures were damaged between Buhl and Coker. A mobile home was destroyed and a church damaged south of Buhl. Numerous trees and utility poles were snapped along the path.
1988	11	20	53	Tuscaloosa	F3	0.5	400	0	8	Tuscaloosa The tornado hit the southern part of Tuscaloosa. 15 homes destroyed, 25 with light to moderate damage, and 50 were slightly damaged.
1990	2	3	1850	Tuscaloosa	F1	6	40	0	3	7 NNW Tuscaloosa A small mobile home park was struck. One mobile home was destroyed and 5 others received moderate damage. 25 more homes had extensive roof damage.
1990	2	3	1845	Tuscaloosa	F0	0.3	20	0	0	Elrod Trees were uprooted and one mobile home was displaced off of its foundation.
1993	5	3	1835	Tuscaloosa	F2	6	50	0	3	Brookwood-Kellerman 25 homes and 12 mobile homes were damaged. Several homes were destroyed.
1994	3	27	1602	Tuscaloosa	F1	2	100	0	0	15.0 NE Tuscaloosa 3 high voltage power line structures were damaged and several trees downed.
1995	7	4	1555	Tuscaloosa	F0	0.5	50	0	0	Elrod-Echola Tuscaloosa Fire Deptment witnessed a tornado with little to no damage.
1995	3	7	1503	Tuscaloosa	F0	2	80	0	0	Samantha

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										Numerous trees and power lines downed. 1 mobile home destroyed and 6 had minor damage, and 2 barns destroyed.
1997	1	28	8	Tuscaloosa	F2	2	73	0	1	5.0 N Coker-5.5 NNE Coker Several trees downed. Several homes had roof damage and one home was completely deroofed.
1997	1	24	1700	Tuscaloosa	F2	10	200	1	10	5.0 S Tuscaloosa-8.0 ENE Tuscaloosa Structure damage along the path and numerous trees downed. One fatality occurred in a vehicle.
1998	5	9	1820	Pickens-Tuscaloosa	F0	6.5	70	0	0	1.4 S Gordo-2.3 NE Holman Downed trees and minor structure damage.
1998	4	8	1842	Tuscaloosa-Jefferson	F5	30.3	1320	32	259	10.0 NNW Brookwood-Pratt City Tremendous damage along the path.
1998	4	8	1801	Pickens-Tuscaloosa	F3	19.5	300	0	1	2.0 S Gordo-7.6 N Northport 5 homes destroyed and 24 others damaged. 11 mobile homes destroyed and several damaged.
2000	12	16	1254	Tuscaloosa	F4	18	750	11	144	4.9 W Hull-2.9 ENE Cottondale Tremendous damage occurred to several subdivisions, a shopping center, and a mobile home park with many structures disintegrated. 9 fatalities occurred in mobile homes, 1 in a vehicle, and 1 in a building.
2000	4	3	1120	Tuscaloosa-Jefferson	F2	11.1	300	0	0	1.2 SW Kellerman-2.2 SSW Oak Grove

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										Numerous trees and power lines downed. Several homes received minor damage and one brick home sustained major damage. A few mobile homes were destroyed.
2000	3	10	2028	Tuscaloosa	F0	3.3	50	0	0	7.6 NE Northport-10.9 NE Northport Numerous trees downed and several homes had roof damage.
2000	3	10	2015	Tuscaloosa	F0	1.8	60	0	0	1.5 N Fosters-2.5 NE Fosters Numerous trees downed. Several homes and buildings were damaged.
2001	11	24	1237	Tuscaloosa	F0	0.2	30	0	0	6.1 E Abernant-6.3 E Abernant Brief touchdown near mile marker 100 on I-59 near Bucksville.
2001	11	24	1139	Tuscaloosa	F1	2	75	0	0	5.8 SW Samantha-3.8 SW Samantha Several trees were downed and one home was damaged. The damage occurrd near the intersection of Rue Road and CR 90.
2002	11	10	2222	Tuscaloosa-Jefferson	F2	15.2	450	0	3	3.2 NW Abernant-1.8 SSW Bessemer Numerous trees were downed. Several structures were damaged along the path.
2003	11	18	1147	Tuscaloosa	F1	6.3	100	0	2	2.4 SSE Tuscaloosa-5.6 NNE Tuscaloosa

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										A weak tornado began at approximately 11:47 am CST just northeast of the intersection of Interstate 359 and Interstate 20/59. For the first 1.7 miles, damage was very weak and sporatic with mainly a few trees topped or uprooted. The weak tornado approached University Mall and the intersection of 15th St and McFarland Blvd., the intersity increased slightly with more significant damage in the form of shingles removed from structures, more trees downed, and large signs downed. A number of commercial structures sustained some degree of damage, and one commercial structure had a portion of the north-facing wall collapse while shingles were removed from the roof. The increased intensity continued for about 2.3 miles covering the area southwest and northeast of the 15th St and McFarland Blvd intersection. The damage seemed to once again decrease for the last 2.3 miles of the tornado track. Only teo very minor injuries were reported with this storm.
2005	9	25	1714	Tuscaloosa	F0	0.1	10	0	0	3.7 N Coker

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										A brief and weak tornado touched down right in Lake Lurleen at approximately 614 PM CDT. The short lived tornado was visible to many people and was captured on camera as it pulled water up and out of the lake. The tornado quickly dissipated a few yards into the rural countryside. This tornado developed from the same parent thunderstorm that produced tornado three in Buhl. The tornado damage path was 0.10 miles long and was 25 yards wide at its widest point. This tornado was produced by the remnants of Hurricane Rita.
2005	9	25	1659	Tuscaloosa	F1	4.8	125	0	0	2.6 S Buhl-2.2 N Buhl

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										The third tornado to affect the Buhl Community in one afternoon touched down at approximately 559 PM CDT. The tornado started just east of Sipsey Valley Road and moved due north. The tornado damaged several homes near Sipsey Valley Road and Sipsey Lane. The tornado moved over rural countryside and then entered Buhl. The Volunteer Fire Department and several other buildings sustained minor roof damage. The tornado then turned to the left and crossed County Road 140 and US Highway 82. The tornado moved along the Sipsey River north of US 82 and lifted around 606 PM CDT. Numerous trees and several power lines were snapped off or were uprooted along the path. This tornado was occurred from the same parent thunderstorm that produced the tornado down the street on Sipsey Valley Road. The tornado damage path was 4.8 miles long and 125 yards wide at its widest point. This tornado was produced by the remnants of Hurricane Rita.
2005	9	25	1652	Tuscaloosa	F0	1.2	60	0	0	6.2 S Buhl-5.0 S Buhl

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										A tornado touched down at approximately 552 PM CDT along Sipsey Valley Road between Buhl and Romulus. The tornado damaged three homes and snapped off several trees near Sipsey Valley Road. The tornado lifted in the rural countryside east of Sipsey Valley Road around 553 PM CDT. The tornado damage path was 1.2 miles long and 60 yards wide at its widest point. This tornado was produced by the remnants of Hurricane Rita.
2005	9	25	1524	Tuscaloosa	F0	5	60	0	0	6.5 SW Samantha-1.8 S Samantha The Lake Lurleen parent thunderstorm re-organized again and produced a weak tornado near Lake Tuscaloosa. The tornado touched down east of State Highway 171 near Rue Road at approximately 424 PM CDT. The tornado tracked northeast and crossed US Highway 43 before it lifted along the banks of Lake Tuscaloosa around 431 PM CDT. The tornado produced light tree damage along its path and one home suffered minor damage. The tornado damage path was 5 miles long and 60 yards wide at its widest point. This tornado was produced by the remnants of Hurricane Rita.
2005	9	25	1519	Tuscaloosa	F0	5.8	100	0	0	4.5 NE Buhl-4.7 SW Samantha

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										The parent thunderstorm that produced the tornado on the west side of Lake Lurleen re-organized and developed another tornado on the east side of the lake. The tornado touched down just west of Lake Lurleen Road near the southern end of the lake at approximately 419 PM CDT. The tornado produced light tree damage near the east side of the lake. The tornado continued northeast where it strengthened as it neared State Highway 171. Numerous trees and power lines were knocked down in this area and the highway was temporarily closed. The tornado lifted shortly after it crossed the highway around 426 PM CDT. A few structures along the path suffered minor damage. The tornado damage path was 5.8 miles long and 100 yards wide at its widest point. This tornado was produced by the remnants of Hurricane Rita.
2005	9	25	1505	Tuscaloosa	F1	6.7	150	0	2	1.3 S Buhl-5.8 NE Buhl

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										The second tornado that affected the Buhl community within an hour touched down at approximately 405 PM CDT. The tornado began just east of County Road 19 near Cornelius Church Road. The tornado traveled northeast and produced significant damage in the Buhl community. Three mobile homes were totally destroyed, two mobile homes suffered major damage, and at least 4 others sustained minor damage on McAllister Road. Two male occupants of a mobile home were injured when the high winds demolished the home. One man was hospitalized. The tornado continued northeastward and crossed County Road 140, US Highway 82 and County Road 21. Several more structures sustained minor roof damage along the path. Additionally, numerous trees were snapped off or uprooted. The tornado snapped off several trees along the northwest side of Lake Lurleen before lifting just north of the lake around 417 PM CDT. This was the same parent thunderstorm that produced the brief tornado near the Tuscaloosa Greene County Line. Local media outlets captured this tornado on video. The tornado has been rated an F1 on the Fujita Scale. The tornado damage path was 6.7 miles long and 150 yards wide at its widest point. This tornado was produced by the remnants of Hurricane Rita.
2005	9	25	1455	Tuscaloosa	F1	13.8	100	0	0	0.6 E Elrod-5.3 W Samantha

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										National Weather Service meteorologists performed extensive aerial and ground surveys across northern Tuscaloosa County. It has been determined that a tornado produced damage along a large stretch of the Sipsey River Basin. The tornado touched down at approximately 355 PM CDT near County Road 140 just east of Elrod. The tornado traveled northeast along the Sipsey River, crossed County Road 21, crossed State Highway 171, and lifted just east of County Road 35 around 417 PM CDT. A large majority of the damage was minor and limited to tree damage. Numerous trees were snapped off or uprooted along the Sipsey River. The tornado has been rated an F1 on the Fujita Scale. The tornado damage path was 13.8 miles long and 100 yards wide at its widest point. This was the same thunderstorm cell that produced the brief tornado touchdown in rural southeastern Pickens County. This tornado was produced by the remnants of Hurricane Rita.
2005	9	25	1454	Greene-Tuscaloosa	F0	0.3	25	0	0	12 NE Union

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										Several storm spotters in western Tuscaloosa County reported a brief tornado touch down on the Greene and Tuscaloosa County Line in the Sipsey Swamp. The tornado occurred between 354 and 355 PM CDT. The tornado snapped off a few trees along its short path. The tornado has been rated an F0 on the Fujita Scale. The total damage path was only 3/10 of a mile long and 25 yards wide at its widest point. This tornado was produced by the remnants of Hurricane Rita.
2005	9	25	1405	Tuscaloosa	F0	0.8	50	0	0	8.2 NW Samantha-8.0 NW Samantha National Weather Service meteorologists performed aerial and ground surveys across northern Tuscaloosa County. It has been determined that a brief tornado occurred along Mormon Road. The tornado touched down just west of Mormon Road (County Road 35) just north of Northside Road (County Road 38). The tornado was on the ground for about 3/4 of a mile and crossed Mormon Road. At least two homes suffered minor roof damage. Several trees were snapped off along the short path. This was the same storm that produced the damage on Robertson Road. The tornado has been rated an F0 on the Fujita Scale. The tornado damage path was 0.75 miles long and 50 yards wide at its widest point. This tornado was produced by the remnants of Hurricane Rita.
2005	9	25	1355	Tuscaloosa	F0	1.6	80	0	0	3.5 NW Echola-4.7 NW Echola

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										National Weather Service meteorologists performed aerial and ground surveys across northwest Tuscaloosa County. The damage that occurred along Robertson Road was determined to be a tornado. The tornado touched down west of Cooper Road and Robertson Road near Dunn Creek at approximately 255 PM CDT. The tornado traveled just east of north and crossed Robertson Road. At least two homes suffered roof damage and several out-buildings and barns were damaged. Several trees were snapped off or blown down along the path. The tornado lifted around 257 PM CDT along the Right Hand Fork. The tornado has been rated an F0 on the Fujita Scale. The tornado damage path was 1.6 miles long and 80 yards wide at its widest point. This tornado was produced by the remnants of Hurricane Rita.
2005	4	30	316	Tuscaloosa	F0	6.9	100	0	0	2.2 NW Northport-5.8 NE Northport

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										National Weather Service meteorologists conducted a survey across areas just north northwest of Northport. It has been determined the area had experienced an F0 tornado, with winds of estimated around 65 mph. The tornado touched down around 416 AM CDT about one half mile west of the CR 86 and US 43 intersection. The tornado then moved northeast, crossing SR 69 and CR 47 before lifting near the end of CR 87 around 424 AM CDT. The tornado damage path was 6.9 miles long and 100 yards wide at its widest point. Numerous trees and power lines were snapped off along the path. The most concentrated damage was near the end of the path from the far southeastern tip of Lake Tuscaloosa to near the end of CR 87. In this area, several homes received minor damage and two homes received significant roof damage due to fallen trees. This storm also produced large hail. The largest hail reported was golf ball size and occurred across the southern parts of Lake Tuscaloosa.
2006	3	13	1754	Tuscaloosa	F0	0.1	20	0	0	9.9 N Samantha An F0 tornado briefly touched down in rural northern Tuscaloosa County just east of US Highway 43. The tornado produced little to no damage. A storm spotter captured images of the tornado.
2006	3	13	1743	Tuscaloosa - Fayette	F0	3.4	30	0	0	9.3 NW Samantha

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										Storm Spotters tracked a tornado on the ground from near County Road 35 in far northern Tuscaloosa County to near New Hope Road in far southeastern Fayette County. The tornado only broke a few limbs off of trees as it moved through the rural countryside. The total damage path was 3.4 miles long.
2007	3	1	1500	Tuscaloosa	F1	3.73	100	0	0	1.4 WNW Samantha-3.1 NE Samantha The tornado touched down about 2 miles northwest of Samantha, near the intersection of Lesueur Road and Nazareth Church Road. It then tracked northeastward, crossed US Highway 43, and lifted near the intersection John Swindle Road and Joe Namath Road. Numerous trees were either snapped or uprooted along the path. One brick home lost a portion of its roof.
2007	2	13	1710	Tuscaloosa-Bibb	F1	9.71	400	0	0	3.1 WSW Hagler - 1.04 ESE Harmon The tornado touched down in southeastern Tuscaloosa County in the Talladega National Forest, and from there moved nearly due east. The heaviest damage was near the intersection of County Road 1 and US Highway 82 on the Bibb and Tuscaloosa County Line. Several trailers, homes, barns and sheds were damaged along the path. Additionally, numerous trees were snapped off and downed. The tornado continued into Bibb County where it lifted just north of Eoline.

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
2008	3	4	50	Tuscaloosa	F1	0.79	200	0	0	3.5 WNW Samantha - 3.7 NW Samantha The tornado touched down in the Northside Community, in the northern portion of Tuscaloosa County. Along its short path, it affected areas along Old Fayette Road, CR-38, and Billy Bigham Road. At least six homes were damaged and one home sustained significant damage. At least one vehicle was badly damaged by a fallen tree. Several hundred trees were either snapped off or were blown down.
2008	2	6	251	Fayette-Tuscaloosa-Walker	F2	26.19	2000	0	4	1.6 E Newtonville - 1.5 NNW Oakman

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										A tornado that would eventually cross 3 county lines first touched down in southeastern Fayette County, about a mile southeast of the Newtonville Community. From there the tornado moved on a northeast path, for about 6.5 miles, before crossing briefly into Tuscaloosa County. In this segment of its path, damage was generally light until the tornado approached the Tuscaloosa County Line, when several mobile homes were hit and badly damaged. The tornado crossed into Tuscaloosa County just south of Fayette CR-68. The tornado that touched down in southeastern Fayette County entered Tuscaloosa County just west of the New Lexington Community. From there, the tornado continued its northeastward path, staying just inside Tuscaloosa County for about 5.5 miles. The tornado damaged a gas station building in New Lexington, and downed numerous trees. The tornado then moved back into Fayette County near Upper Ridge Road. The Newtonville tornado moved back into Fayette County, and continued its journey northeastward. In this segment, the tornado moved through a sparsely populated area between the city of Berry and the Boley Springs Community. No significant structures were hit, and only sporadic tree damage was observed. The tornado reached the Walker County line just west of Fayette CR-83. The tornado that first touched down in Fayette County, and also moved through a small portion of Tuscaloosa County, moved into southeastern Walker County just southwest of the Corona Community. From there, the tornado traveled northeast for about 6.5 miles, and finally lifted northwest of the

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
2008	1	10	1611	Tuscaloosa	F3	5.62	350	0	0	6.2 SE Sterling - 8.2 E Sterling The tornado touched down around just southwest of the intersection of AL-69 and CR-38, near Windham Springs. From there, it traveled northeast across the intersection, and then roughly parallel to CR-38 for about 5 miles, before lifting northeast of the Wiley Community. At least 5 structures were heavily damaged, including a church in Windham Springs and a general store in Wiley. At least 300 trees were either snapped or uprooted along the damage path.
2008	1	10	1543	Pickens - Tuscaloosa	F1	2.03	100	0	0	2.2 ESE Gordo - 2.5 SW Echola The tornado touched down between Gordo and the Tuscaloosa County Line, near the intersection of Ben Elmore Road and CR-33. From there, it travelled east-northeast before crossing into Tuscaloosa County. A barn and several old chicken houses on CR-33 east of Gordo sustained heavy damage. The tornado was on the ground for less than a minute in Tuscaloosa County, producing only minor tree damage.
2009	5	6	757	Tuscaloosa	F1	0.23	100	0	0	3.3 SSE Shirley

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										The tornado touched down along CR-21 on the western side of Lake Arnedra, crossed the lake, and then lifted on the eastern shore. Two large hardwood trees were blown down onto houses causing major damage to one of the homes and making it uninhabitable. Another hardwood was toppled on the western shore of the lake.
2009	5	6	748	Tuscaloosa	F1	0.5	100	0	0	4.3 NNW Samantha The tornado touched down briefly near AL-13, south of the New Lexington Community. Two homes sustained moderate damage. One home had its garage door blown in and subsequently a wall blown out. Wind entered into another home's attic and blew out a portion of the roof. A wooden projectile (1 by 6) was blown approximately 100 yards and embedded into the side of a home. A pontoon boat was also overturned.
2009	4	2	1443	Tuscaloosa	F1	0.59	150	0	0	1.8 NW Samantha - 1.9 NNW Samantha The tornado touched down near the intersection of Lesueur Road and Old Fayette Road, near the Samantha Community. It then moved northeastward for about one half of a mile, and lifted just north of Brady Montgomery Road. The most significant damage occurred as the tornado crossed Brady Montgomery Road. Numerous hardwood and softwood trees were snapped off and uprooted.

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
2011	4	27	1543	Greene-Tuscaloosa-Jefferson	F4	80.68	2600	64	1500	1.4 SSW Mantua - 0.8 W Black Creek

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										A tornado touched down in northern Greene County and moved northeast through southern Tuscaloosa and western Jefferson Counties, where it caused devastating damage consistent with a violent EF4 rating to portions of the city of Tuscaloosa and western suburbs of Birmingham, before it lifted northeast of downtown Birmingham. The tornado initially touched down just south of the intersection of CR 60 and CR 208 in Greene County, and moved northeast, crossing mostly rural areas and causing significant tree damage. One outbuilding was destroyed with the debris being swept away and pieces of farm equipment flipped over. This damage was consistent with an EF2 rating with winds of 125 mph. The tornado crossed into Tuscaloosa County just north of CR 60. This tornado was produced by a supercell thunderstorm that began in Newton County Mississippi at 13:54 pm CST, finally dissipating in Macon County, North Carolina at approximately 21:18 pm CST. This supercell spawned several strong to violent tornadoes along its long path. The tornado entered Tuscaloosa County just north of CR 60, west northwest of Ralph, and moved northeast causing tree damage and minor structural damage consistent with an EF2 rating and winds of 125 mph. The tornado strengthened as it crossed the Black Warrior River, north of Interstate 20 and approached Tuscaloosa. As the tornado approached Interstate 359, several buildings were destroyed including the Tuscaloosa County Emergency Operations Center. The tornado strengthened further to a violent EF4 with winds of 190 mph. Along 15th St E. and McFarland Blvd E.,

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
2011	4	27	1440	Pickens-Tuscaloosa-Fayette-	F4	127.80	1408	13	54	4.6 NW Union Chapel - 2.8 SSW Crossroads

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
				Walker-Cullman-Blount-						The tornado track began about 3 miles northeast of Pickensville in Pickens County, and continued northeast along Double Branches Road, near County Road 49. Just northeast of Reform, the tornado destroyed a few chicken houses and tossed grain feed bins up to 100 yards (EF-1). The tornado caused roof damage to houses and destroyed a few outbuildings as it crossed Alabama Highway 159 north of County Road 49. The tornado then moved into Tuscaloosa County. It crossed Alabama Highway 171 just south of County Road 76, with significant tree damage (EF-2) in a narrow path. The tornado clipped a small part of south central Fayette County along County Road 12 just west of U.S. Highway 43, with tree damage and minor structural damage (EF-1). The Tornado then moved back into Tuscaloosa County, crossing U.S. Highway 43 just north of County Road 12, with only a narrow path width of (EF-0 to EF-1) tree damage. The tornado continued east-northeastward across north central Tuscaloosa County causing mostly minor tree and structural damage before crossing into Fayette County along Old Jasper Road. The tornado strengthened as it approached the Boley Springs area. It crossed County Road 83 north of old Jasper Road where it caused considerable damage to trees and completely destroyed at least one mobile home (EF-3). The frame separated and the remaining debris was thrown a considerable distance which resulted in at least two fatalities. The tornado appeared to strengthen even further as it reached Willcut Road and County Road 46. In this area several mobile homes were completely destroyed with debris thrown a

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
2011	4	27	417	Tuscaloosa-Jefferson	F3	20.26	200	0	0	1.3 WSW Coaling - 1.3 NNE Kimbrel

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										This tornado developed along a QLCS in southeast Tuscaloosa County, near Coaling and moved northeastward for approximately 18 miles. It crossed into Jefferson County between Interstate 20 and Bucksville, then continued for nearly 2 miles into Jefferson County. The tornado touched down in the southwestern extent of Coaling, north of CR 14, along Staghorne Drive where it damaged many trees. The tornado quickly strengthened as it moved through Coaling to an EF3 rating with winds of 155 mph as it remained south of US Highway 11. At least a dozen homes sustained damage. Several homes were completely destroyed. The tornado weakened as it moved east of Coaling and crossed US Highway 11. The tornado moved across the Mercedes Plant where it caused minor roof damage to one building. It also knocked down several light poles along Interstate 20 and snapped numerous trees. This damage was consistent with an EF1 rating and winds of 100 mph. The tornado continued to cause tree damage as it moved northeast and approached the Jefferson County Line. The tornado crossed into Jefferson County between Interstate 20 and Bucksville. The tornado weakened as it entered Jefferson County near Tingle Springs Circle to an EF0 and its path width gradually became less until the tornado lifted near the intersection of Old Tuscaloosa Highway and Lowetown Road. Along its path in Jefferson County, the tornado caused tree damage.

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
2011	4	27	341	Pickens-Tuscaloosa	F3	22.46	704	0	0	5.3 SSE Gordo - 3.5 E Samantha

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										This tornado developed along a QLCS in far eastern Pickens County, 5.5 miles south southeast of Gordo and moved northeastward for 3.46 miles. It crossed into Tuscaloosa County just to the west of Holman, south of AL Highway 140. This tornado continued for almost 19 miles in Tuscaloosa County before it dissipated 2.5 miles east northeast of Samantha. The tornado touched down east of AL Highway 63, along Grover Plate Road where it uprooted many hardwood trees. The tornado continued to cause tree damage as it moved northeast and approached the Tuscaloosa County Line. The tornado damage in Pickens County was consistent with an EF1 rating and winds of 90 mph. As the tornado entered Tuscaloosa County and crossed US Highway 82, its path widened to near 400 yds and it strengthened to an EF2 where it uprooted numerous trees. Northeast of Holman, the tornado strengthened to an EF3 with winds of 140 mph and caused significant damage to a home. It removed the roof and tossed it at least 200 yds. A 3500 pound trailer was thrown about 100 yds. The tornado continued northeast where it crossed AL Highway 171 and US Highway 43. Thousands of trees were snapped or uprooted and many homes sustained damage due to the fallen trees. In addition, at least 3 outbuildings sustained damage or were destroyed. The tornado tracked south of Samantha and dissipated along North Hagler Road.

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
2011	4	15	1414	Greene-Tuscaloosa	F3	18.37	500	0	0	2.5 ENE Knoxville - 1.6 WSW Box Springs The tornado touched down north of County Road 86 in Greene County. It then moved northeast into Tuscaloosa, where it eventually lifted. In Greene County, the tornado was rated an EF-1, with maximum winds of 90 mph. Dozens of hard and softwood trees were either snapped or uprooted. The tornado crossed into Tuscaloosa County 3 miles southwest of Ralph, approximately one half mile west of Lock 9 Road. The tornado strengthened to an EF-3 rating, with maximum winds of 140 mph. Hundreds of trees were snapped or uprooted and a power transmission tower was severely damaged. As the tornado moved northeast into Taylorville, several homes and businesses received structural damage. The tornado lifted near Mayfair Drive, south of Veterans Memorial Parkway.
2012	1	23	309	Tuscaloosa-Jefferson	F2	13.13	880	1	1	7.1 N Kellerman - 0.8 NE Gilmore

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
										A tornado touched down in northeastern Tuscaloosa County just east of the Black Warrior River and then traveled into Jefferson County. The tornado initially touched down one mile west of Groundhog Road, approximately 3 miles northwest of Bull City. Here, dozens of soft and hardwood trees were snapped or uprooted. The tornado then traveled to the northeast with winds of 100 MPH, snapping and uprooting hundreds of trees along the track. It then crossed into Jefferson County, eventually lifting along Toadvine Road, just southwest of Short Creek. This tornado initially touched down in northeast Tuscaloosa County, and traveled to the northeast, crossing into Jefferson County northeast of Groundhog Road. As the tornado tracked toward, across, and then parallel to Lock 17 Rd, numerous trees were snapped or uprooted. The tornado continued northeastward crossing Camp Oliver Road and took a turn to the north at Blue Sky Road. Tree damage continued as the tornado tracked parallel to Toadvine Road, as winds increased to a maximum of 130 MPH. It lifted along Toadvine Road just southwest of Short Creek. Several structures received varying degrees of damage long the path and one fatality occurred along Toadvine Road when a manufactured home was completely destroyed. The injury also occurred in Jefferson County.

Year	Month	Day	Time (CST)	County	Damage Scale	Path Length (Miles)	Maximum Path Width (Yards)	Fatalities	Injuries	Location
2012	1	23	300	Tuscaloosa	F2	0.56	300	0	0	8.4 NW Burchfield - 8.6 NW Burchfield A tornado, with maximum winds speeds estimated to be 115 mph, touched down about one quarter of a mile west of Watermelon Road, where it snapped and uprooted a few small pine trees. From there, the tornado traveled northeast and hit a hunting camp, where approximately twenty small pine trees were snapped and eight campers were rolled. Three of the campers were destroyed and the other five received differing degrees of damage. The tornado continued northeast crossing Watermelon Road, where it snapped three wooden H-frame transmission lines before lifting just to the east of Watermelon Road.
2012	1	23	242	Tuscaloosa	F2	0.45	400	0	0	4.2 E Shirley - 4.5 E Shirley A tornado, with maximum winds speeds estimated at 120 mph, touched down near the intersection of Alabama Highway 171 and Koffman Ranch Road, in the Koffman area. Approximately two dozen pine trees were uprooted in the location. The tornado then traveled northeast destroying one outbuilding along Koffman Spur. Just to the northeast of Koffman Spur, a barn was destroyed and the entire roof was torn off of a well-constructed single family residence. The tornado lifted before reaching Carroll Creek.

Source: National Weather Service

Past Occurrences of Severe Storms

Table E-3. Tuscaloosa County Heavy Rain Events, 1996-2013

5 PRECIPITATION event(s) were reported in **Tuscaloosa County, Alabama** between **01/01/1996** and **12/31/2013**.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:					0	0	0.00K	0.00K
TUSCALOOSA	1/26/1996	12:00	Heavy Rain		0	0	0.00K	0.00K
RIVER VIEW	7/10/2011	16:42	Heavy Rain		0	0	0.00K	0.00K
RIVER VIEW	3/23/2012	7:10	Heavy Rain		0	0	0.00K	0.00K
RIVER VIEW	8/7/2012	12:50	Heavy Rain		0	0	0.00K	0.00K
ROSEDALE	6/5/2013	16:43	Heavy Rain		0	0	0.00K	0.00K
Totals:					0	0	0.00K	0.00K

Source: National Climatic Data Center

Table E-4. Tuscaloosa County Thunderstorm and High Wind Events, 1996-2013

216 THUNDERSTORM & HIGH WIND event(s) were reported in **Tuscaloosa County, Alabama** between **01/01/1996** and **12/31/2013**.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:					2	9	5.453 M	35.00K
TUSCALOOSA	3/6/1996	20:30	Thunderstorm Wind	50 kts.	0	0	50.00K	0.00K
HOLT JUNCTION	4/14/1996	17:40	Thunderstorm Wind	0 kts.	0	0	25.00K	0.00K
TUSCALOOSA	4/22/1996	23:28	Thunderstorm Wind	60 kts.	0	1	200.00K	5.00K
SAMANTHA	6/23/1996	16:15	Thunderstorm Wind	50 kts.	0	0	18.00K	0.00K
TUSCALOOSA	7/27/1996	16:00	Thunderstorm Wind	50 kts.	0	0	10.00K	0.00K
TUSCALOOSA	9/2/1996	17:30	Thunderstorm Wind	50 kts.	0	0	10.00K	0.00K
NORTHPORT	4/22/1997	13:20	Thunderstorm Wind	50 kts.	0	0	5.00K	0.00K
TUSCALOOSA	5/3/1997	3:05	Thunderstorm Wind	50 kts.	0	0	8.00K	0.00K
SAMANTHA	5/9/1997	8:34	Thunderstorm Wind	50 kts.	0	0	5.00K	0.00K
TUSCALOOSA	7/5/1997	1:00	Thunderstorm Wind		0	0	5.00K	0.00K
TUSCALOOSA	2/26/1998	15:00	Thunderstorm Wind	50 kts.	0	0	2.00K	0.00K
TUSCALOOSA	2/26/1998	15:15	Thunderstorm Wind	50 kts.	0	0	3.00K	0.00K
NORTHPORT	5/6/1998	17:00	Thunderstorm Wind	50 kts.	0	0	20.00K	0.00K
TUSCALOOSA	5/9/1998	19:27	Thunderstorm Wind	65 kts.	0	0	75.00K	20.00K
COUNTYWIDE	6/5/1998	13:45	Thunderstorm Wind	60 kts.	0	2	45.00K	10.00K
TUSCALOOSA	7/20/1998	14:38	Thunderstorm Wind	50 kts.	0	0	20.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
TUSCALOOSA	2/27/1999	19:10	Thunderstorm Wind	55 kts.	0	0	5.00K	0.00K
TUSCALOOSA (ZONE)	6/9/1999	14:25	High Wind	43 kts.	0	2	3.00K	0.00K
SAMANTHA	6/24/1999	13:20	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
TUSCALOOSA	7/24/1999	19:55	Thunderstorm Wind	50 kts.	0	0	5.00K	0.00K
TUSCALOOSA (ZONE)	11/2/1999	5:00	High Wind	45 kts.	0	0	5.00K	0.00K
TUSCALOOSA	1/3/2000	23:15	Thunderstorm Wind	50 kts. E	0	0	2.00K	0.00K
COUNTYWIDE	2/13/2000	19:56	Thunderstorm Wind	65 kts. E	0	0	250.00K	0.00K
TUSCALOOSA	2/13/2000	20:11	Thunderstorm Wind	80 kts. E	0	0	30.00K	0.00K
COUNTYWIDE	3/10/2000	20:15	Thunderstorm Wind	55 kts. E	0	0	30.00K	0.00K
TUSCALOOSA	3/10/2000	20:35	Thunderstorm Wind	75 kts. E	1	0	900.00K	0.00K
ELROD	4/2/2000	20:35	Thunderstorm Wind	55 kts. E	0	0	2.00K	0.00K
ECHOLA	4/3/2000	11:00	Thunderstorm Wind	65 kts. E	0	0	10.00K	0.00K
NEW LEXINGTON	4/20/2000	20:33	Thunderstorm Wind	55 kts. E	0	0	3.00K	0.00K
BROOKWOOD	7/15/2000	17:08	Thunderstorm Wind	50 kts. E	0	0	1.00K	0.00K
COUNTYWIDE	7/20/2000	15:15	Thunderstorm Wind	65 kts. E	0	0	150.00K	0.00K
FOSTERS	8/10/2000	19:20	Thunderstorm Wind	50 kts. E	0	0	3.00K	0.00K
TUSCALOOSA	11/8/2000	23:00	Thunderstorm Wind	50 kts. E	0	0	1.00K	0.00K
TUSCALOOSA (ZONE)	11/24/2000	18:00	High Wind	45 kts. E	0	0	2.00K	0.00K
SAMANTHA	12/16/2000	16:15	Thunderstorm Wind	50 kts. E	0	0	2.00K	0.00K
TUSCALOOSA	1/29/2001	15:20	Thunderstorm Wind	50 kts. E	0	0	1.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
TUSCALOOSA	2/9/2001	17:48	Thunderstorm Wind	50 kts. E	0	0	2.00K	0.00K
TUSCALOOSA	2/9/2001	18:00	Thunderstorm Wind	55 kts. E	0	0	3.00K	0.00K
BROOKWOOD	2/9/2001	18:05	Thunderstorm Wind	50 kts. E	0	0	2.00K	0.00K
COUNTYWIDE	2/16/2001	14:10	Thunderstorm Wind	65 kts. E	0	2	250.00K	0.00K
TUSCALOOSA (ZONE)	3/12/2001	20:10	High Wind	40 kts. E	1	1	14.00K	0.00K
BROOKWOOD	4/3/2001	15:35	Thunderstorm Wind	50 kts. E	0	0	5.00K	0.00K
DUNCANVILLE	5/21/2001	13:06	Thunderstorm Wind	50 kts. E	0	0	6.00K	0.00K
COUNTYWIDE	7/5/2001	14:50	Thunderstorm Wind	55 kts. E	0	0	4.00K	0.00K
NORTHPORT	8/18/2001	13:55	Thunderstorm Wind	50 kts. E	0	0	1.00K	0.00K
VANCE	8/18/2001	14:20	Thunderstorm Wind	50 kts. E	0	0	1.00K	0.00K
NORTHPORT	12/17/2001	21:55	Thunderstorm Wind	50 kts. E	0	0	8.00K	0.00K
TUSCALOOSA	4/8/2002	15:50	Thunderstorm Wind	55 kts. E	0	1	5.00K	0.00K
BROOKWOOD	5/17/2002	18:20	Thunderstorm Wind	55 kts. E	0	0	2.00K	0.00K
NORTHPORT	5/30/2002	14:40	Thunderstorm Wind	50 kts. E	0	0	3.00K	0.00K
FOSTERS	6/27/2002	15:20	Thunderstorm Wind	50 kts. E	0	0	3.00K	0.00K
TUSCALOOSA	8/2/2002	15:45	Thunderstorm Wind	50 kts. E	0	0	14.00K	0.00K
COTTONDALE	8/3/2002	17:20	Thunderstorm Wind	50 kts. E	0	0	2.00K	0.00K
NORTHPORT	11/10/2002	21:59	Thunderstorm Wind	65 kts. E	0	0	200.00K	0.00K
DUNCANVILLE	4/6/2003	17:27	Thunderstorm Wind	60 kts. EG	0	0	23.00K	0.00K
FOSTERS	5/6/2003	17:40	Thunderstorm Wind	50 kts.	0	0	3.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
				EG				
FOSTERS	5/17/2003	13:22	Thunderstorm Wind	50 kts. EG	0	0	13.00K	0.00K
NORTHPORT	5/17/2003	13:34	Thunderstorm Wind	50 kts. EG	0	0	18.00K	0.00K
COUNTYWIDE	6/12/2003	13:30	Thunderstorm Wind	55 kts. EG	0	0	27.00K	0.00K
NORTHPORT	7/21/2003	16:40	Thunderstorm Wind	50 kts. EG	0	0	30.00K	0.00K
TUSCALOOSA	7/21/2003	17:05	Thunderstorm Wind	50 kts. EG	0	0	8.00K	0.00K
NORTHPORT	2/5/2004	18:02	Thunderstorm Wind	60 kts. ES	0	0	2.00K	0.00K
SAMANTHA	2/5/2004	18:55	Thunderstorm Wind	60 kts. ES	0	0	5.00K	0.00K
FOSTERS	2/5/2004	19:40	Thunderstorm Wind	60 kts. ES	0	0	50.00K	0.00K
TUSCALOOSA	2/5/2004	19:58	Thunderstorm Wind	60 kts. ES	0	0	6.00K	0.00K
TUSCALOOSA	2/5/2004	20:45	Thunderstorm Wind	60 kts. ES	0	0	2.00K	0.00K
TUSCALOOSA	5/31/2004	3:20	Thunderstorm Wind	50 kts. EG	0	0	8.00K	0.00K
COKER	5/31/2004	3:20	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
COUNTYWIDE	6/3/2004	17:40	Thunderstorm Wind	55 kts. EG	0	0	8.00K	0.00K
TUSCALOOSA	6/8/2004	17:20	Thunderstorm Wind	50 kts. EG	0	0	6.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
COTTONDALE	6/16/2004	19:35	Thunderstorm Wind	60 kts. EG	0	0	10.00K	0.00K
SAMANTHA	6/22/2004	15:38	Thunderstorm Wind	55 kts. EG	0	0	2.00K	0.00K
NORTHPORT	7/25/2004	15:41	Thunderstorm Wind	60 kts. EG	0	0	6.00K	0.00K
TUSCALOOSA	8/20/2004	15:20	Thunderstorm Wind	50 kts. EG	0	0	11.00K	0.00K
DUNCANVILLE	8/28/2004	15:40	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
TUSCALOOSA (ZONE)	9/16/2004	7:30	High Wind	56 kts. EG	0	0	1.700M	0.00K
DUNCANVILLE	12/7/2004	6:05	Thunderstorm Wind	52 kts. EG	0	0	1.00K	0.00K
TUSCALOOSA ARPT	12/7/2004	6:45	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K
NORTHPORT	12/7/2004	7:00	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K
COUNTYWIDE	12/9/2004	6:45	Thunderstorm Wind	53 kts. EG	0	0	8.00K	0.00K
COUNTYWIDE	1/13/2005	8:31	Thunderstorm Wind	55 kts. EG	0	0	110.00K	0.00K
TUSCALOOSA (ZONE)	4/2/2005	9:00	Strong Wind	30 kts. MG	0	0	1.00K	0.00K
COUNTYWIDE	4/30/2005	3:02	Thunderstorm Wind	55 kts. EG	0	0	60.00K	0.00K
TUSCALOOSA (ZONE)	6/11/2005	18:00	Strong Wind	40 kts. EG	0	0	3.00K	0.00K
KELLERMAN	8/5/2005	18:41	Thunderstorm Wind	53 kts. EG	0	0	5.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
TUSCALOOSA	8/13/2005	16:20	Thunderstorm Wind	52 kts. EG	0	0	16.00K	0.00K
SAMANTHA	3/9/2006	16:36	Thunderstorm Wind	55 kts. EG	0	0	10.00K	0.00K
COALING	3/9/2006	17:28	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
SAMANTHA	4/7/2006	23:43	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
SAMANTHA	4/7/2006	23:55	Thunderstorm Wind	55 kts. EG	0	0	10.00K	0.00K
TUSCALOOSA	4/21/2006	14:15	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
FOSTERS	5/10/2006	14:02	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
SAMANTHA	8/5/2006	16:22	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
COKER	11/30/2006	22:15	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
TUSCALOOSA	1/5/2007	3:30	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
ROSEDALE	1/5/2007	3:30	Thunderstorm Wind	53 kts. MG	0	0	0.00K	0.00K
SAMANTHA	3/1/2007	15:20	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
UNIVERSITY	4/4/2007	1:05	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
DUNCANVILLE	4/4/2007	1:05	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
TUSCALOOSA	6/18/2007	16:55	Thunderstorm Wind	30 kts. EG	0	0	3.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
VETERANS HOSPITAL	7/20/2007	14:35	Thunderstorm Wind	60 kts. EG	0	0	50.00K	0.00K
NORTHPORT	8/18/2007	17:00	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
GREELEY	8/27/2007	16:00	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
ABERNANT	8/27/2007	16:01	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
RIVER VIEW	10/18/2007	16:45	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
MOORES BRIDGE	10/19/2007	0:15	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
TUSCALOOSA (ZONE)	1/29/2008	20:45	Strong Wind	39 kts. EG	0	0	20.00K	0.00K
SHIRLEY	2/12/2008	16:15	Thunderstorm Wind	35 kts. EG	0	0	0.50K	0.00K
ROSEDALE	2/12/2008	16:23	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
BUCKSVILLE	3/15/2008	1:35	Thunderstorm Wind	50 kts. EG	0	0	0.50K	0.00K
TUSCALOOSA	4/4/2008	13:59	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
STOKES	4/4/2008	14:04	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
NEW LEXINGTON	5/8/2008	12:59	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
STERLING	5/8/2008	13:27	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
PETERSON	5/8/2008	14:31	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
EAST BROCKWOOD	6/14/2008	14:58	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
TAYLORVILLE	6/25/2008	17:05	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
TAYLORVILLE	6/25/2008	17:06	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
STERLING	7/22/2008	15:15	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
FOX	7/31/2008	19:15	Thunderstorm Wind	40 kts. EG	0	0	0.50K	0.00K
NORTHPORT	8/7/2008	12:01	Thunderstorm Wind	60 kts. EG	0	0	10.00K	0.00K
TUSCALOOSA (ZONE)	2/11/2009	11:30	Strong Wind	43 kts. EG	0	0	1.00K	0.00K
FOSTERS	2/18/2009	18:30	Thunderstorm Wind	50 kts. EG	0	0	0.50K	0.00K
NORTHPORT	2/18/2009	18:45	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
TUSCALOOSA	3/26/2009	3:10	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
TUSCALOOSA (ZONE)	3/28/2009	5:30	Strong Wind	35 kts. EG	0	0	15.00K	0.00K
SHIRLEY	4/2/2009	14:33	Thunderstorm Wind	45 kts. EG	0	0	0.50K	0.00K
SHIRLEY	4/2/2009	14:40	Thunderstorm Wind	40 kts. EG	0	0	0.50K	0.00K
BURCHFIELD	4/2/2009	14:55	Thunderstorm Wind	50 kts. EG	0	0	0.50K	0.00K
PHALAN	4/2/2009	20:39	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DUDLEY	4/2/2009	20:40	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
BUCKSVILLE	4/2/2009	20:40	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
TUSCALOOSA (ZONE)	4/12/2009	22:00	High Wind	50 kts. EG	0	0	75.00K	0.00K
BUHL	4/19/2009	14:40	Thunderstorm Wind	40 kts. EG	0	0	0.50K	0.00K
COTTONDALE	4/19/2009	15:58	Thunderstorm Wind	40 kts. EG	0	0	0.50K	0.00K
FOSTERS	5/6/2009	8:00	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
NORTHPORT	5/6/2009	8:10	Thunderstorm Wind	61 kts. EG	0	0	15.00K	0.00K
COTTONDALE	6/2/2009	14:00	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
COTTONDALE	6/2/2009	14:14	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
COTTONDALE	6/2/2009	14:26	Thunderstorm Wind	60 kts. EG	0	0	10.00K	0.00K
SAMANTHA	6/12/2009	15:11	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
ABERNANT	6/12/2009	15:56	Thunderstorm Wind	45 kts. EG	0	0	2.00K	0.00K
HOLMAN	6/12/2009	16:37	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
SAMANTHA	6/14/2009	10:10	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
SAMANTHA	6/14/2009	10:26	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
BROOKWOOD	6/14/2009	10:33	Thunderstorm Wind	40 kts. EG	0	0	0.50K	0.00K
HOWTON	6/14/2009	10:40	Thunderstorm Wind	45 kts. EG	0	0	0.50K	0.00K
STERLING	6/28/2009	15:50	Thunderstorm Wind	45 kts. EG	0	0	1.00K	0.00K
RIVER VIEW	7/29/2009	21:05	Thunderstorm Wind	43 kts. EG	0	0	5.00K	0.00K
BUHL	9/26/2009	6:15	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
ROSEDALE	10/9/2009	16:14	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
SHIRLEY	12/8/2009	22:01	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
BUHL	12/8/2009	22:05	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
TUSCALOOSA (ZONE)	12/24/2009	18:00	Strong Wind	43 kts. EG	0	0	2.00K	0.00K
FOSTERS	5/20/2010	15:15	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
TAYLORVILLE	5/20/2010	15:39	Thunderstorm Wind	60 kts. EG	0	0	200.00K	0.00K
HOLT JCT	5/20/2010	16:05	Thunderstorm Wind	60 kts. EG	0	0	100.00K	0.00K
FOSTERS	6/15/2010	16:45	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
HOLMAN	6/15/2010	16:45	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
HAGLER	6/15/2010	17:10	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
FOX	6/19/2010	12:20	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
LYNN HAVEN	6/19/2010	12:37	Thunderstorm Wind	55 kts. EG	0	0	5.00K	0.00K
ENGLEWOOD	6/25/2010	13:29	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
CLOVERDALE	6/26/2010	11:45	Thunderstorm Wind	55 kts. EG	0	0	5.00K	0.00K
RIVER VIEW	6/26/2010	12:18	Thunderstorm Wind	55 kts. EG	0	0	10.00K	0.00K
VANCE	6/26/2010	12:54	Thunderstorm Wind	50 kts. EG	0	0	8.00K	0.00K
TAYLORVILLE	7/26/2010	20:45	Thunderstorm Wind	55 kts. EG	0	0	3.00K	0.00K
RIVER VIEW	10/12/2010	18:20	Thunderstorm Wind	55 kts. EG	0	0	6.00K	0.00K
NORTHPORT	10/24/2010	1:55	Thunderstorm Wind	55 kts. EG	0	0	2.00K	0.00K
VANCE	10/24/2010	20:10	Thunderstorm Wind	60 kts. EG	0	0	3.00K	0.00K
COKER	10/25/2010	1:40	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
NORTHPORT	10/25/2010	1:55	Thunderstorm Wind	55 kts. EG	0	0	3.00K	0.00K
SAMANTHA	11/30/2010	6:08	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
TUSCALOOSA (ZONE)	1/1/2011	2:00	Strong Wind	35 kts. EG	0	0	0.50K	0.00K
NORTHPORT	2/24/2011	23:28	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
RIVER VIEW	2/24/2011	23:32	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
MOORES BRIDGE	4/4/2011	17:38	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
CLOVERDALE	4/4/2011	17:53	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
MOORES BRIDGE	4/4/2011	17:59	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
CLOVERDALE	4/4/2011	18:08	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
ABERNANT	4/4/2011	18:28	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
COKER	4/11/2011	17:24	Thunderstorm Wind	60 kts. EG	0	0	5.00K	0.00K
FOX	4/11/2011	17:36	Thunderstorm Wind	50 kts. EG	0	0	4.00K	0.00K
ROSEDALE	4/20/2011	8:01	Thunderstorm Wind	64 kts. EG	0	0	50.00K	0.00K
HOWTON	4/20/2011	8:15	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
COALING	4/20/2011	8:20	Thunderstorm Wind	50 kts. EG	0	0	25.00K	0.00K
COTTONDALE	4/20/2011	8:25	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
SHIRLEY	4/20/2011	21:40	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
GREELEY	4/20/2011	22:15	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
(TCL)TUSCALOOSA ARPT	4/27/2011	4:02	Thunderstorm Wind	62 kts. MG	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
RIVER VIEW	4/27/2011	4:04	Thunderstorm Wind	68 kts. MG	0	0	3.00K	0.00K
TAYLORVILLE	6/2/2011	16:35	Thunderstorm Wind	35 kts. EG	0	0	1.00K	0.00K
ECHOLA	6/21/2011	13:10	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
SAMANTHA	8/24/2011	18:25	Thunderstorm Wind	35 kts. EG	0	0	0.50K	0.00K
TUSCALOOSA (ZONE)	9/5/2011	15:50	Strong Wind	39 kts. EG	0	0	2.00K	0.00K
HOLMAN	1/23/2012	2:25	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
COKER	1/23/2012	2:40	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
RIVER VIEW	6/11/2012	18:28	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
CLOVERDALE	6/11/2012	18:33	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
HOLT JCT	6/11/2012	18:37	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
SAMANTHA	6/11/2012	18:39	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
RIVER VIEW	7/10/2012	14:57	Thunderstorm Wind	51 kts. MG	0	0	0.00K	0.00K
RIVER VIEW	7/10/2012	14:58	Thunderstorm Wind	56 kts. MG	0	0	0.00K	0.00K
HOLT JCT	7/10/2012	15:03	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
SAMANTHA	7/10/2012	15:03	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
COKER	7/10/2012	15:08	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
COTTONDALE	7/10/2012	15:13	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
RIVER VIEW	7/10/2012	15:14	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
MOORES BRIDGE	7/10/2012	15:35	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
NEW LEXINGTON	8/13/2012	11:20	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
RALPH	8/18/2012	4:40	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
BOX SPGS	8/18/2012	5:20	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
SAMANTHA	12/25/2012	17:51	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
COKER	1/30/2013	6:44	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
RIVER VIEW	3/18/2013	14:23	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
COKER	7/23/2013	12:21	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
Totals:					2	9	5.453 M	35.00K

Source: National Climatic Data Center

Table E-5. Tuscaloosa County Lightning Events, 1996-2013

30 LIGHTNING event(s) were reported in **Tuscaloosa County, Alabama** between **01/01/1996** and **12/31/2013**.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:					0	8	795.00K	5.00K
TUSCALOOSA	7/7/1996	19:30	Lightning		0	0	10.00K	0.00K
TUSCALOOSA	7/8/1996	17:55	Lightning		0	0	25.00K	0.00K
TUSCALOOSA	7/24/1996	17:00	Lightning		0	0	15.00K	0.00K
TUSCALOOSA	6/30/1997	18:00	Lightning		0	0	8.00K	0.00K
ELROD	7/1/1997	2:00	Lightning		0	0	0.00K	5.00K
SAMANTHA	7/23/1997	15:00	Lightning		0	3	2.00K	0.00K
BROOKWOOD	7/23/1997	17:55	Lightning		0	0	75.00K	0.00K
TUSCALOOSA	7/24/1998	17:26	Lightning		0	0	10.00K	0.00K
ABERNANT	6/4/2002	19:30	Lightning		0	0	40.00K	0.00K
COUNTYWIDE	7/2/2002	15:00	Lightning		0	0	50.00K	0.00K
TUSCALOOSA	7/30/2002	15:15	Lightning		0	1	0.00K	0.00K
TUSCALOOSA	5/14/2003	6:30	Lightning		0	0	50.00K	0.00K
NORTHPORT	5/16/2003	20:23	Lightning		0	0	5.00K	0.00K
BROOKWOOD	7/21/2003	16:52	Lightning		0	1	2.00K	0.00K
TUSCALOOSA	4/7/2004	17:00	Lightning		0	0	70.00K	0.00K
TUSCALOOSA	6/16/2004	19:35	Lightning		0	1	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
COUNTYWIDE	3/31/2005	2:00	Lightning		0	0	65.00K	0.00K
TUSCALOOSA	6/16/2005	17:13	Lightning		0	0	48.00K	0.00K
TUSCALOOSA	7/6/2005	14:20	Lightning		0	0	60.00K	0.00K
COUNTYWIDE	8/5/2005	18:41	Lightning		0	0	60.00K	0.00K
TUSCALOOSA	8/13/2005	16:20	Lightning		0	0	45.00K	0.00K
VANCE	2/3/2006	19:15	Lightning		0	1	0.00K	0.00K
TUSCALOOSA	5/10/2006	5:45	Lightning		0	0	0.00K	0.00K
TUSCALOOSA	7/30/2006	14:30	Lightning		0	0	10.00K	0.00K
TUSCALOOSA	8/15/2006	15:15	Lightning		0	1	0.00K	0.00K
SAMANTHA	4/4/2007	1:05	Lightning		0	0	50.00K	0.00K
COTTONDALE	6/29/2007	15:46	Lightning		0	0	25.00K	0.00K
TAYLORVILLE	7/20/2007	14:45	Lightning		0	0	25.00K	0.00K
FOSTERS	7/20/2007	15:00	Lightning		0	0	25.00K	0.00K
COALING	8/27/2007	16:00	Lightning		0	0	20.00K	0.00K
Totals:					0	8	795.00K	5.00K

Source: National Climatic Data Center

Table E-6. Tuscaloosa County Hail Events, 1996-2013

188 HAIL event(s) were reported in **Tuscaloosa County, Alabama** between **01/01/1996** and **12/31/2013.**

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:					0	0	699.00K	18.00K
TUSCALOOSA	1/18/1996	17:05	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	3/6/1996	21:20	Hail	0.75 in.	0	0	15.00K	0.00K
HOLT JUNCTION	4/14/1996	17:40	Hail	0.75 in.	0	0	0.00K	0.00K
SAMANTHA	6/23/1996	16:15	Hail	0.75 in.	0	0	8.00K	2.00K
TUSCALOOSA	12/12/1996	13:30	Hail	0.75 in.	0	0	5.00K	0.00K
TUSCALOOSA	1/24/1997	15:15	Hail	1.00 in.	0	0	7.00K	0.00K
TUSCALOOSA	1/24/1997	15:30	Hail	1.50 in.	0	0	7.00K	0.00K
TUSCALOOSA	1/24/1997	16:20	Hail	0.75 in.	0	0	5.00K	2.00K
NORTHPORT	1/24/1997	21:04	Hail	0.75 in.	0	0	5.00K	0.00K
FOSTERS	10/21/1997	16:00	Hail	0.75 in.	0	0	2.00K	0.00K
MOORES BRIDGE	3/6/1998	1:35	Hail	1.75 in.	0	0	3.00K	0.00K
NORTHPORT	3/19/1998	22:00	Hail	1.00 in.	0	0	0.00K	0.00K
TUSCALOOSA	3/19/1998	22:07	Hail	1.00 in.	0	0	0.00K	0.00K
TUSCALOOSA	3/19/1998	22:16	Hail	0.75 in.	0	0	0.00K	0.00K
FOSTERS	3/19/1998	22:24	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	3/19/1998	22:30	Hail	0.75 in.	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
SAMANTHA	4/8/1998	17:20	Hail	0.75 in.	0	0	0.00K	0.00K
NORTHPORT	4/8/1998	18:10	Hail	0.75 in.	0	0	0.00K	0.00K
NORTHPORT	4/8/1998	18:18	Hail	0.75 in.	0	0	0.00K	0.00K
VANCE	4/8/1998	20:05	Hail	0.88 in.	0	0	0.00K	0.00K
HOLT JCT	4/8/1998	21:34	Hail	0.75 in.	0	0	0.00K	0.00K
NORTHPORT	4/18/1998	9:38	Hail	0.75 in.	0	0	0.00K	0.00K
NORTHPORT	4/18/1998	16:40	Hail	0.75 in.	0	0	0.00K	0.00K
DUNCANVILLE	5/3/1998	15:25	Hail	0.75 in.	0	0	0.00K	0.00K
NORTHPORT	5/6/1998	17:10	Hail	1.00 in.	0	0	2.00K	0.00K
COTTONDALE	5/6/1998	17:25	Hail	1.25 in.	0	0	4.00K	0.00K
TUSCALOOSA	5/6/1998	17:45	Hail	1.25 in.	0	0	5.00K	2.00K
DUNCANVILLE	5/6/1998	17:55	Hail	1.00 in.	0	0	2.00K	0.00K
TUSCALOOSA	5/9/1998	18:40	Hail	1.00 in.	0	0	2.00K	0.00K
NORTHPORT	5/9/1998	18:49	Hail	1.75 in.	0	0	10.00K	4.00K
NORTHPORT	5/9/1998	18:52	Hail	1.75 in.	0	0	10.00K	4.00K
BROOKWOOD	5/9/1998	19:48	Hail	1.25 in.	0	0	4.00K	4.00K
SAMANTHA	5/9/1998	21:35	Hail	0.88 in.	0	0	0.00K	0.00K
TUSCALOOSA	6/15/1998	19:25	Hail	0.75 in.	0	0	0.00K	0.00K
NORTHPORT	6/20/1998	14:46	Hail	1.00 in.	0	0	2.00K	0.00K
TUSCALOOSA	6/20/1998	14:50	Hail	1.75 in.	0	0	5.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
TUSCALOOSA	1/18/1999	2:21	Hail	0.88 in.	0	0	0.00K	0.00K
TUSCALOOSA	2/9/1999	15:06	Hail	0.88 in.	0	0	0.00K	0.00K
BUHL	5/6/1999	1:06	Hail	0.75 in.	0	0	0.00K	0.00K
ECHOLA	6/2/1999	13:10	Hail	1.00 in.	0	0	0.00K	0.00K
TUSCALOOSA	6/2/1999	13:40	Hail	0.75 in.	0	0	0.00K	0.00K
TAYLORVILLE	6/2/1999	14:38	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	6/2/1999	14:41	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	6/24/1999	13:45	Hail	1.00 in.	0	0	6.00K	0.00K
TUSCALOOSA	2/13/2000	19:40	Hail	0.75 in.	0	0	0.00K	0.00K
ELROD	2/13/2000	19:50	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA ARPT	2/13/2000	19:55	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	3/9/2000	20:50	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	3/9/2000	20:55	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	3/9/2000	21:00	Hail	1.75 in.	0	0	3.00K	0.00K
BROOKWOOD	3/9/2000	21:25	Hail	0.75 in.	0	0	0.00K	0.00K
COTTONDALE	3/10/2000	2:40	Hail	1.00 in.	0	0	1.00K	0.00K
TUSCALOOSA	3/10/2000	16:50	Hail	1.00 in.	0	0	0.00K	0.00K
COTTONDALE	3/10/2000	17:03	Hail	1.00 in.	0	0	0.00K	0.00K
BROWNVILLE	4/3/2000	10:48	Hail	1.00 in.	0	0	0.00K	0.00K
SAMANTHA	8/9/2000	12:00	Hail	0.75 in.	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
VANCE	8/9/2000	13:15	Hail	0.75 in.	0	0	0.00K	0.00K
FOSTERS	8/9/2000	14:27	Hail	1.75 in.	0	0	3.00K	0.00K
COTTONDALE	4/4/2001	6:30	Hail	1.00 in.	0	0	0.00K	0.00K
TUSCALOOSA	4/29/2001	14:30	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	4/29/2001	15:10	Hail	1.00 in.	0	0	0.00K	0.00K
COTTONDALE	4/29/2001	15:20	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	5/9/2001	17:25	Hail	0.88 in.	0	0	0.00K	0.00K
TUSCALOOSA	5/12/2001	13:05	Hail	0.88 in.	0	0	0.00K	0.00K
ECHOLA	5/21/2001	11:50	Hail	0.75 in.	0	0	0.00K	0.00K
NORTHPORT	5/21/2001	11:57	Hail	0.75 in.	0	0	0.00K	0.00K
DUNCANVILLE	5/21/2001	13:06	Hail	0.75 in.	0	0	0.00K	0.00K
ELROD	5/31/2001	14:10	Hail	0.75 in.	0	0	0.00K	0.00K
COALING	11/24/2001	12:08	Hail	2.75 in.	0	0	20.00K	0.00K
KELLERMAN	3/30/2002	9:53	Hail	0.88 in.	0	0	0.00K	0.00K
FOSTERS	4/30/2002	16:20	Hail	2.75 in.	0	0	400.00K	0.00K
BROOKWOOD	5/17/2002	18:20	Hail	1.75 in.	0	0	2.00K	0.00K
TUSCALOOSA	8/2/2002	15:45	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	8/2/2002	17:10	Hail	0.88 in.	0	0	0.00K	0.00K
RALPH	5/2/2003	15:05	Hail	0.75 in.	0	0	0.00K	0.00K
BUHL	5/2/2003	16:11	Hail	1.25 in.	0	0	15.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
BUCKSVILLE	5/2/2003	18:48	Hail	0.88 in.	0	0	0.00K	0.00K
NORTHPORT	5/3/2003	6:40	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	5/6/2003	17:15	Hail	0.75 in.	0	0	0.00K	0.00K
COKER	5/6/2003	17:40	Hail	0.88 in.	0	0	0.00K	0.00K
ABERNANT	5/6/2003	17:50	Hail	0.88 in.	0	0	0.00K	0.00K
BROOKWOOD	5/6/2003	18:04	Hail	0.75 in.	0	0	0.00K	0.00K
FOSTERS	5/17/2003	13:01	Hail	1.00 in.	0	0	0.00K	0.00K
TUSCALOOSA ARPT	5/17/2003	13:16	Hail	1.25 in.	0	0	1.00K	0.00K
NORTHPORT	5/17/2003	13:22	Hail	1.75 in.	0	0	8.00K	0.00K
NORTHPORT	5/17/2003	13:34	Hail	1.00 in.	0	0	0.00K	0.00K
BROOKWOOD	5/17/2003	14:35	Hail	1.00 in.	0	0	0.00K	0.00K
TUSCALOOSA	5/17/2003	18:13	Hail	0.75 in.	0	0	0.00K	0.00K
NORTHPORT	6/2/2003	18:19	Hail	1.00 in.	0	0	5.00K	0.00K
BROOKWOOD	7/10/2003	13:00	Hail	0.75 in.	0	0	0.00K	0.00K
VANCE	2/5/2004	22:28	Hail	0.75 in.	0	0	0.00K	0.00K
NORTHPORT	4/7/2004	17:20	Hail	1.00 in.	0	0	0.00K	0.00K
VANCE	4/10/2004	23:28	Hail	0.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	6/3/2004	17:40	Hail	1.00 in.	0	0	0.00K	0.00K
TUSCALOOSA	6/8/2004	17:20	Hail	1.75 in.	0	0	3.00K	0.00K
NORTHPORT	7/25/2004	15:41	Hail	0.75 in.	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
DUNCANVILLE	8/28/2004	15:40	Hail	0.75 in.	0	0	0.00K	0.00K
ELROD	3/13/2005	16:41	Hail	1.00 in.	0	0	0.00K	0.00K
SAMANTHA	3/13/2005	16:48	Hail	0.75 in.	0	0	0.00K	0.00K
RALPH	3/13/2005	18:54	Hail	1.75 in.	0	0	27.00K	0.00K
COKER	3/13/2005	19:39	Hail	0.75 in.	0	0	0.00K	0.00K
FOSTERS	3/30/2005	21:14	Hail	1.75 in.	0	0	27.00K	0.00K
COALING	3/30/2005	21:37	Hail	0.88 in.	0	0	0.00K	0.00K
DUNCANVILLE	3/31/2005	3:11	Hail	0.75 in.	0	0	0.00K	0.00K
DUNCANVILLE	4/6/2005	13:52	Hail	1.00 in.	0	0	1.00K	0.00K
FOSTERS	4/21/2005	17:55	Hail	1.00 in.	0	0	1.00K	0.00K
TUSCALOOSA	4/21/2005	17:59	Hail	1.75 in.	0	0	11.00K	0.00K
DUNCANVILLE	4/22/2005	11:45	Hail	0.88 in.	0	0	1.00K	0.00K
TUSCALOOSA	4/22/2005	16:50	Hail	0.75 in.	0	0	1.00K	0.00K
ELROD	4/30/2005	3:08	Hail	0.75 in.	0	0	1.00K	0.00K
NORTHPORT	4/30/2005	3:16	Hail	1.75 in.	0	0	8.00K	0.00K
TUSCALOOSA	4/30/2005	3:30	Hail	0.75 in.	0	0	1.00K	0.00K
COKER	5/20/2005	16:20	Hail	1.00 in.	0	0	0.00K	0.00K
VANCE	8/21/2005	17:10	Hail	1.00 in.	0	0	0.00K	0.00K
NORTHPORT	2/3/2006	18:30	Hail	0.88 in.	0	0	0.00K	0.00K
COALING	3/13/2006	20:11	Hail	0.75 in.	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
SAMANTHA	4/3/2006	1:19	Hail	0.88 in.	0	0	0.00K	0.00K
TUSCALOOSA	4/8/2006	0:05	Hail	0.88 in.	0	0	0.00K	0.00K
NORTHPORT	4/21/2006	0:43	Hail	0.88 in.	0	0	0.00K	0.00K
NORTHPORT	4/21/2006	0:51	Hail	0.75 in.	0	0	0.00K	0.00K
NORTHPORT	4/21/2006	13:58	Hail	1.00 in.	0	0	0.00K	0.00K
NORTHPORT	4/21/2006	14:01	Hail	0.88 in.	0	0	0.00K	0.00K
FOSTERS	2/13/2007	16:45	Hail	1.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	2/13/2007	16:45	Hail	0.75 in.	0	0	0.00K	0.00K
STERLING	2/13/2007	16:48	Hail	0.75 in.	0	0	0.00K	0.00K
TAYLORVILLE	2/13/2007	16:52	Hail	1.75 in.	0	0	0.00K	0.00K
TUSCALOOSA	2/13/2007	16:55	Hail	2.75 in.	0	0	5.00K	0.00K
DUNCANVILLE	2/13/2007	17:13	Hail	1.75 in.	0	0	0.00K	0.00K
UNIVERSITY	2/13/2007	17:18	Hail	2.50 in.	0	0	5.00K	0.00K
DUNCANVILLE	2/13/2007	17:23	Hail	1.00 in.	0	0	0.00K	0.00K
BUHL	3/1/2007	15:00	Hail	0.88 in.	0	0	0.00K	0.00K
TUSCALOOSA	3/1/2007	15:24	Hail	1.00 in.	0	0	0.00K	0.00K
NORTHPORT	3/1/2007	15:25	Hail	2.75 in.	0	0	0.00K	0.00K
SAMANTHA	3/1/2007	15:30	Hail	1.75 in.	0	0	0.00K	0.00K
BROOKWOOD	3/1/2007	15:58	Hail	0.88 in.	0	0	0.00K	0.00K
NORTHPORT	3/1/2007	16:35	Hail	0.88 in.	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
TUSCALOOSA	7/20/2007	14:35	Hail	1.75 in.	0	0	0.00K	0.00K
NORTHPORT	3/15/2008	1:15	Hail	0.88 in.	0	0	0.00K	0.00K
PHALAN	3/15/2008	1:26	Hail	0.88 in.	0	0	0.00K	0.00K
VANCE	4/4/2008	14:22	Hail	0.75 in.	0	0	0.00K	0.00K
SHIRLEY	4/11/2008	14:35	Hail	0.88 in.	0	0	0.00K	0.00K
BOX SPGS	6/1/2008	14:18	Hail	1.75 in.	0	0	0.00K	0.00K
YOLANDE	6/11/2008	16:58	Hail	0.88 in.	0	0	0.00K	0.00K
(TCL)TUSCALOOSA ARPT	6/25/2008	17:32	Hail	1.00 in.	0	0	0.00K	0.00K
CLOVERDALE	6/25/2008	17:40	Hail	0.88 in.	0	0	0.00K	0.00K
SAMANTHA	7/29/2008	16:35	Hail	0.88 in.	0	0	0.00K	0.00K
SAMANTHA	8/2/2008	17:24	Hail	1.75 in.	0	0	0.00K	0.00K
VANCE	2/18/2009	16:40	Hail	0.88 in.	0	0	0.00K	0.00K
NORTHPORT	2/18/2009	17:50	Hail	1.00 in.	0	0	0.00K	0.00K
TAYLORVILLE	2/18/2009	17:53	Hail	0.75 in.	0	0	0.00K	0.00K
STOKES	2/28/2009	4:30	Hail	0.75 in.	0	0	0.00K	0.00K
BURCHFIELD	4/2/2009	14:55	Hail	0.75 in.	0	0	0.00K	0.00K
BUHL	4/19/2009	14:35	Hail	0.75 in.	0	0	0.00K	0.00K
BUHL	9/26/2009	6:20	Hail	0.75 in.	0	0	0.00K	0.00K
MOORES BRIDGE	3/12/2010	3:26	Hail	1.00 in.	0	0	0.00K	0.00K
VANCE	4/24/2010	12:51	Hail	0.88 in.	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
RALPH	5/20/2010	14:55	Hail	0.88 in.	0	0	0.00K	0.00K
FOSTERS	5/20/2010	15:12	Hail	1.75 in.	0	0	40.00K	0.00K
ROSEDALE	5/20/2010	15:35	Hail	0.88 in.	0	0	0.00K	0.00K
RALPH	5/20/2010	15:48	Hail	1.00 in.	0	0	0.00K	0.00K
COTTONDALE	5/20/2010	16:11	Hail	1.75 in.	0	0	0.00K	0.00K
STERLING	5/28/2010	17:17	Hail	0.88 in.	0	0	0.00K	0.00K
ROSEDALE	6/25/2010	12:59	Hail	0.75 in.	0	0	0.00K	0.00K
VANCE	10/24/2010	20:10	Hail	1.25 in.	0	0	0.00K	0.00K
VANCE	10/24/2010	20:14	Hail	1.75 in.	0	0	0.00K	0.00K
BUCKSVILLE	10/24/2010	20:20	Hail	1.75 in.	0	0	0.00K	0.00K
GRIMES	3/26/2011	14:16	Hail	0.88 in.	0	0	0.00K	0.00K
NEW LEXINGTON	3/26/2011	22:33	Hail	0.75 in.	0	0	0.00K	0.00K
HOLT JCT	3/27/2011	23:50	Hail	0.75 in.	0	0	0.00K	0.00K
ABERNANT	3/28/2011	0:10	Hail	1.00 in.	0	0	0.00K	0.00K
TAYLORVILLE	6/2/2011	16:35	Hail	0.88 in.	0	0	0.00K	0.00K
SAMANTHA	6/5/2011	15:47	Hail	1.25 in.	0	0	0.00K	0.00K
NEW LEXINGTON	3/2/2012	15:00	Hail	1.00 in.	0	0	0.00K	0.00K
STERLING	3/2/2012	16:20	Hail	1.75 in.	0	0	0.00K	0.00K
BUCKSVILLE	3/2/2012	18:46	Hail	1.75 in.	0	0	0.00K	0.00K
SAMANTHA	3/2/2012	19:35	Hail	1.75 in.	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
SAMANTHA	3/2/2012	19:37	Hail	1.00 in.	0	0	0.00K	0.00K
MAXWELL	3/2/2012	19:50	Hail	1.00 in.	0	0	0.00K	0.00K
SAMANTHA	3/2/2012	20:07	Hail	1.75 in.	0	0	0.00K	0.00K
SHOOK	3/31/2012	20:05	Hail	1.25 in.	0	0	0.00K	0.00K
ECHOLA	5/2/2012	17:40	Hail	1.00 in.	0	0	0.00K	0.00K
TAYLORVILLE	5/21/2012	23:52	Hail	0.88 in.	0	0	0.00K	0.00K
SHOOK	7/1/2012	15:11	Hail	1.00 in.	0	0	0.00K	0.00K
CEDAR COVE	8/10/2012	16:45	Hail	0.75 in.	0	0	0.00K	0.00K
ABERNANT	3/18/2013	14:28	Hail	1.00 in.	0	0	0.00K	0.00K
GREELEY	3/18/2013	14:31	Hail	1.00 in.	0	0	0.00K	0.00K
GREELEY	3/18/2013	14:31	Hail	1.00 in.	0	0	0.00K	0.00K
ELROD	6/28/2013	16:40	Hail	1.00 in.	0	0	0.00K	0.00K
Totals:					0	0	699.00K	18.00K

Source: National Climatic Data Center

Past Occurrences of Floods

Table E-7. Tuscaloosa County Flood Events, 1996-2013

43 FLOOD event(s) were reported in **Tuscaloosa County, Alabama** between **01/01/1996** and **12/31/2013**.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:					0	0	521.00K	5.00K
TUSCALOOSA	7/24/1996	16:00	Flash Flood		0	0	65.00K	0.00K
TUSCALOOSA	9/2/1996	17:30	Flash Flood		0	0	30.00K	0.00K
TUSCALOOSA	7/22/1997	4:15	Flash Flood		0	0	25.00K	0.00K
COUNTYWIDE	1/7/1998	9:30	Flash Flood		0	0	60.00K	5.00K
SOUTH PORTION	9/21/1998	0:00	Flash Flood		0	0	4.00K	0.00K
SOUTH PORTION	10/3/1998	18:00	Flash Flood		0	0	15.00K	0.00K
TUSCALOOSA	6/2/1999	14:25	Flash Flood		0	0	5.00K	0.00K
COUNTYWIDE	4/3/2000	6:00	Flash Flood		0	0	25.00K	0.00K
COUNTYWIDE	9/22/2002	6:30	Flash Flood		0	0	50.00K	0.00K
TUSCALOOSA (ZONE)	5/8/2003	5:30	Flood		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	5/18/2003	23:00	Flood		0	0	0.00K	0.00K
TUSCALOOSA	6/17/2003	18:00	Flash Flood		0	0	10.00K	0.00K
COUNTYWIDE	2/5/2004	20:30	Flash Flood		0	0	5.00K	0.00K
COUNTYWIDE	2/5/2004	23:30	Flash Flood		0	0	5.00K	0.00K
COUNTYWIDE	11/24/2004	4:45	Flash Flood		0	0	11.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
TUSCALOOSA (ZONE)	4/1/2005	0:00	Flood		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	4/6/2005	0:00	Flood		0	0	0.00K	0.00K
NORTHPORT	5/20/2005	17:13	Flash Flood		0	0	10.00K	0.00K
COUNTYWIDE	7/10/2005	20:00	Flash Flood		0	0	6.00K	0.00K
TUSCALOOSA	8/13/2005	16:29	Flash Flood		0	0	13.00K	0.00K
TUSCALOOSA	8/29/2005	16:00	Flash Flood		0	0	10.00K	0.00K
ELROD	5/10/2006	12:00	Flash Flood		0	0	0.00K	0.00K
SAMANTHA	7/30/2006	15:25	Flash Flood		0	0	0.00K	0.00K
NORTHPORT	3/1/2007	16:28	Flash Flood		0	0	0.00K	0.00K
SAMANTHA	12/11/2008	14:27	Flash Flood		0	0	0.00K	0.00K
MOORES BRIDGE	1/6/2009	10:00	Flash Flood		0	0	25.00K	0.00K
RIVER VIEW	2/27/2009	12:55	Flash Flood		0	0	0.00K	0.00K
SAMANTHA	2/27/2009	16:01	Flash Flood		0	0	0.00K	0.00K
NORTHPORT	8/20/2009	16:40	Flash Flood		0	0	0.00K	0.00K
NORTHPORT	8/20/2009	17:00	Flash Flood		0	0	0.00K	0.00K
RIVER VIEW	9/18/2009	18:45	Flash Flood		0	0	10.00K	0.00K
RALPH	9/21/2009	4:00	Flash Flood		0	0	1.00K	0.00K
PHALAN	9/21/2009	4:00	Flash Flood		0	0	1.00K	0.00K
RIVER VIEW	5/20/2010	16:30	Flash Flood		0	0	0.00K	0.00K
RIVER VIEW	6/25/2010	1:45	Flash Flood		0	0	5.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
RIVER VIEW	7/26/2010	21:50	Flash Flood		0	0	100.00K	0.00K
ENGLEWOOD	8/6/2010	19:02	Flash Flood		0	0	30.00K	0.00K
(TCL)TUSCALOOSA ARPT	3/9/2011	6:30	Flash Flood		0	0	0.00K	0.00K
RIVER VIEW	4/15/2011	12:30	Flash Flood		0	0	0.00K	0.00K
MOORES BRIDGE	9/5/2011	10:36	Flash Flood		0	0	0.00K	0.00K
MOORES BRIDGE	9/5/2011	17:30	Flood		0	0	0.00K	0.00K
DUNCANVILLE	9/3/2012	20:45	Flash Flood		0	0	0.00K	0.00K
ELROD	9/3/2012	21:30	Flash Flood		0	0	0.00K	0.00K
Totals:					0	0	521.00K	5.00K

Source: National Climatic Data Center

Past Occurrences of Hurricanes

Table E-8. Tuscaloosa County Hurricane and Tropical Storm Events, 1996-2013

2 HURRICANE & TROPICAL STORM event(s) were reported in **Tuscaloosa County, Alabama** between **01/01/1996** and **12/31/2013**.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:					0	2	5.700M	0.00K
TUSCALOOSA (ZONE)	7/10/2005	16:00	Tropical Storm		0	0	200.00K	0.00K
TUSCALOOSA (ZONE)	8/29/2005	17:00	Tropical Storm		0	2	5.500M	0.00K
Totals:					0	2	5.700M	0.00K

Source: National Climatic Data Center

Past Occurrences of Winter Storms/Freezes

Table E-9. Tuscaloosa County Snow and Ice Events, 1993-2013

4 SNOW & ICE event(s) were reported in **Tuscaloosa County, Alabama** between **01/01/1996** and **12/31/2013**.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:					0	0	70.00K	1.00K
TUSCALOOSA (ZONE)	1/6/1996	20:00	Winter Storm		0	0	10.00K	1.00K
TUSCALOOSA (ZONE)	2/1/1996	15:00	Winter Storm		0	0	10.00K	0.00K
TUSCALOOSA (ZONE)	12/23/1998	6:00	Ice Storm		0	0	25.00K	0.00K
TUSCALOOSA (ZONE)	1/27/2000	21:00	Winter Storm		0	0	25.00K	0.00K
TUSCALOOSA (ZONE)	1/9/2011	13:05	Ice Storm		0	0	0.00K	0.00K
Totals:					0	0	70.00K	1.00K

Source: National Climatic Data Center

Table E-10. Tuscaloosa County Extreme Cold Events, 1996-2013

2 COLD TEMPERATURE EXTREME event(s) were reported in **Tuscaloosa County, Alabama** between **01/01/1996** and **12/31/2013**.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:					0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	2/28/2002	6:00	Extreme Cold/Wind Chill		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	1/24/2003	0:00	Extreme Cold/Wind Chill		0	0	0.00K	0.00K
Totals:					0	0	0.00K	0.00K

Source: National Climatic Data Center

Past Occurrences of Droughts/Heat Waves

Table E-11. Tuscaloosa County Drought Events, 1996-2013

23 DROUGHT event(s) were reported in **Tuscaloosa County, Alabama** between **01/01/1996** and **12/31/2013**.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:					0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	7/18/2006	7:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	8/1/2006	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	9/1/2006	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	3/27/2007	6:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	4/1/2007	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	5/1/2007	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	6/1/2007	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	7/1/2007	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	8/1/2007	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	9/1/2007	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	10/1/2007	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	11/1/2007	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	12/1/2007	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	1/1/2008	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	2/1/2008	0:00	Drought		0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
TUSCALOOSA (ZONE)	3/1/2008	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	4/1/2008	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	5/1/2008	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	6/1/2008	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	7/29/2008	6:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	8/1/2008	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	8/2/2011	0:00	Drought		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	11/8/2011	0:00	Drought		0	0	0.00K	0.00K
Totals:					0	0	0.00K	0.00K

Source: National Climatic Data Center

Table E-12. Tuscaloosa County Extreme Heat Events, 1996-2013

20 EXTREME HEAT event(s) were reported in **Tuscaloosa County, Alabama** between **01/01/1996** and **12/31/2013**.

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Totals:					1	50	0.00K	125.00K
TUSCALOOSA (ZONE)	2/23/1996	8:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	5/21/1996	12:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	5/23/1996	12:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	5/24/1996	12:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	5/26/1996	12:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	11/6/1996	10:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	3/1/1997	12:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	9/20/1997	13:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	11/10/2002	15:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	10/24/2003	16:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	11/4/2003	15:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	11/5/2003	15:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	8/8/2007	12:00	Heat		1	50	0.00K	0.00K
TUSCALOOSA (ZONE)	8/1/2010	0:00	Heat		0	0	0.00K	125.00K
TUSCALOOSA (ZONE)	7/1/2012	12:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	7/2/2012	12:00	Heat		0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
TUSCALOOSA (ZONE)	7/24/2012	11:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	7/29/2012	11:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	8/1/2012	12:00	Heat		0	0	0.00K	0.00K
TUSCALOOSA (ZONE)	6/13/2013	14:00	Heat		0	0	0.00K	0.00K
Totals:					1	50	0.00K	125.00K

Appendix F
Alternative Mitigation Measures

App. F – Alternative Mitigation Measures

1.0 Identification and Analysis of Alternative Mitigation Measures

This appendix documents the range of alternative mitigation measures considered by the Hazard Mitigation Planning Committee (HMPC) in the development of its mitigation strategy and its selection of final action programs for each participating community. This documentation supports the Federal requirement that the plan must Identify and analyze "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" (44 CFR Section 201.6 (c)(3)(ii)). Included here are the following supporting documents:

1. Committee Exercise – Mitigation Action Program Exercise. This is the exercise administered by the planning team to the HMPC. This exercise was used to gather information on the priority issues to be addressed by the mitigation strategy, the recommended mitigation measures, and the recommended projects for potential funding under the FEMA hazard mitigation assistance programs. Only the first two pages are shown in this appendix.

2. Types of Mitigation Measures. This list describes the comprehensive range of mitigation measures by program area type (Prevention, Protection, Public Outreach and Awareness, Natural Resources Protection, and Structural Projects types), which was one resource to the HMPC in completing the exercise listed above.

3. Table of Alternative Mitigation Measures. This summary table identifies a measure as an action or project, whether new or existing buildings and infrastructure are affected, and the hazard effects that would be reduced by the measure.

The alternative measures described here are all intended to affect the built environment and thereby reduce loss of life and damages to buildings and infrastructure. The planning team used the January 2013 FEMA Publication 508 "Mitigation Ideas" as an additional resource to insure a comprehensive listing of alternative measures was provided. Excluded from these alternatives are measures that might propose to establish disaster response procedures. The mitigation plan is not an emergency response, recovery, or preparedness plan. Consequently, all emergency services measures designed to prepare emergency operations plans, train or equip emergency personnel, programs to reduce mobile technological hazards, plans to counter terrorism and the like are not included in the range of alternatives considered for adoption in this plan. Rather, the purpose of these mitigation measures is to decrease the need for response and recovery through long-term mitigation actions and projects; the intent is not to increase capabilities for response to disasters and recovery from the effects.

According to recent FEMA guidance (Local Multi-Hazard Mitigation Planning Guidance, FEMA, July 1, 2008, page 59), “hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects.” All of the mitigation measures presented here have been evaluated for compatibility with this recent FEMA definition.

Multi-Jurisdictional Mitigation Action Program Exercise

Tuscaloosa County Hazard Mitigation Planning Committee

Name of Community (town, city, or county), School Board, or Agency:

____

Prepared by:____

(name and position)

Instructions for selecting mitigation measures.

1. For Communities, which include all municipalities and the county government, place an X in the column under the Communities column for all those measures your jurisdiction would like to include in your five-year Community Action Program. Mark through those you want to exclude.
2. For School Boards, place the name of the community next to the mitigation measures to be undertaken within the selected community. Only address those measures that will be undertaken by your school board.
3. For Agencies (State, local, non-profit, etc.), place the name of the community next to the mitigation measure recommended for the selected community. These measures are not necessarily the responsibility of your agency.

If you have additional measures to include, please write them down on the back of this page.

Please keep in mind your capabilities to carry out the measure.

Some of the measures might be carried out jointly through the Tuscaloosa County EMA (e.g., outreach activities), Tuscaloosa County (e.g., shared GIS resources), or other agencies.

You do not need to identify the funding source at this time.

2014-2019 Tuscaloosa County Multi-Jurisdictional Mitigation Action Program

	Goal, Objectives and Mitigation Measures	Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
1	Goal for Prevention. Manage the development of land and buildings to minimize risks of loss due to natural 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 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.		All	Both	Action	
1.1.2	Integrate the findings and recommendations of this plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.		All	Both	Action	
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.		All	Both	Action	
1.2	Geographic Information Systems (GIS). Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories.					
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, hurricane surge areas, tornado tracks, disaster events and their extents, and a comprehensive inventory of critical facilities within all jurisdictions.		All	Both	Action	
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.		All	Both	Action	

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.

- *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.

- *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.
- *Coastal Zone Management Regulations.* The physical factors that have the greatest influence on coastal land loss are reductions in sediment supply, relative sea level rise, and frequent storms. The most important human activities are sediment excavation, river modification, and coastal construction. As a result of these agents and activities, coastal land loss is manifested most commonly as beach/bluff erosion and coastal submergence. Implementation of Coastal Zone Management Plans helps to alleviate some of these problems.
- *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.
- *Open Burning Regulations.* Open burning restrictions can be enforced to prevent the spread of wild fires, especially during times of drought when emergency measures could be enacted.
- *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.
- *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 wild fires.
- *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.
- *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.
- *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.

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.

- *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.
- *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.
- *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 hurricanes and severe storms. Tie downs of major appliances and other contents may reduce earthquake damage.

- *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.
- *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 shut downs could cause major disruptions and consequential damages. Relatively low cost portable generations can supply temporary power to small critical facilities, households, and small businesses.
- *Sewer Backup Protection.* Storm water overloads can cause backup into basements through sanitary sewer lines. Houses that have any kind of connection to a sanitary sewer system - whether it is downspouts, footing drain tile, and/or sump pumps, can be flooded during a heavy rain event. To prevent this, there should be no such connections to the system, and all rain and ground water should be directed onto the ground, away from the building. Floor drain plugs and floor drain standpipes keep water from flowing out of the lowest opening in the house. Overhead sewer keeps water in the sewer line during a backup. Backup valves allow sewage to flow out while preventing backups from flowing into the house.

Public Education and Awareness. Public education and awareness methods educate and inform 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.

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 river banks 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 wild fires, 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.
- *Dune and Beach Restoration.* Dune and beach restoration and maintenance can alleviate flooding from hurricanes or severe storms in coastal areas. The dunes provide a natural barrier from the waves and wind which can travel inward causing flooding and major damage to structures.

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.
- *Diversions*. A diversion is simply a new channel that sends floodwater to a different location, thereby reducing flooding along an existing watercourse. Diversions can be surface channels, overflow weirs, or tunnels. During normal flows, the water stays in the old channel. During flood flows, the stream spills over the diversion channel or tunnel, which carries the excess water to the receiving water body.
- *Channel Modifications*. Channel modifications include making a channel wider, deeper, smoother, or straighter. These techniques will result in more water being carried away, but as with other structural techniques, it is important to ensure that the modifications do not create or increase a flooding problem downstream.
- *Dredging.* Dredging involves removal of sediment and other deposits in a river or stream bed to restore flood conveyance. It can be costly because the dredged material must be hauled away and disposed of in another location, and the stream or river bed could quickly fill back in with sediment.
- *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 wild fires.

- *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/Freezes	Hurricanes	Droughts/Heat Waves	Earthquakes	Wildfires	Dam/Levee Failures	Landslides	Sinkholes
PREVENTION MEASURES													
Comprehensive Plans and Smart Growth	Action	Both		X			X			X	X	X	X
Capital Improvements Plans	Action	Both	X	X	X	X	X	X	X	X	X	X	X
Zoning and Land Development Controls	Action	Both		X			X			X	X	X	X
Subdivision Regulations	Action	Both		X			X			X	X	X	X
Building & Technical Codes	Action	Both	X	X	X	X	X	X	X	X	X	X	X
Flood Plain Management Programs	Action	Both		X							X		
Storm Water Management Regulations	Action	Both		X	X								
Dam Safety Management	Action	Both		X							X		
Coastal Zone Management Regulations	Action	Both		X	X		X						
Open Space Requirements	Action	Both		X			X			X		X	X
Open Burning Regulations	Action	Both								X			
Safe Room/Shelter Requirements	Action	Both	X		X		X		X				
Public Right-of-Way Maintenance Regulations	Action	Both		X	X					X			
Critical Facilities Assessments	Action	Both	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
Technology Programs	Action	Both	X	X			X		X				
Planning Studies	Action	Both	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/Freezes	Hurricanes	Droughts/Heat Waves	Earthquakes	Wildfires	Dam/Levee Failures	Landslides	Sinkholes
PROPERTY PROTECTION MEASURES													
Acquisitions Projects	Project	Existing		X			X					X	X
Building Elevations	Project	Existing		X									
Flood Proofing	Project	Existing		X									
Building Retrofits	Project	Existing	X	X	X	X	X	X	X	X			
Building Relocations	Project	Existing		X			X					X	X
Critical Facilities Protection	Project	Existing	X	X	X	X	X	X	X	X			
Emergency Power Generation	Project	Both	X		X	X	X		X				
Sewer Backup Protection	Project	Both		X									
PUBLIC EDUCATION AND AWARENESS MEASURES													
Community Hazard Mitigation Plan Distribution	Action	Both	X	X	X	X	X	X	X	X	X	X	X
Flood Map Information	Action	Both		X			X						
Outreach Projects	Action	Both	X	X	X	X	X	X	X	X	X	X	X
Hazard Insurance Awareness	Action	Both	X	X			X		X	X		X	X
Real Estate Disclosure	Action	Both		X									
Library	Action	Both	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
Education Programs	Action	Both	X	X	X	X	X	X	X	X	X	X	X
Mass Media Relations	Action	Both	X	X	X	X	X	X	X	X	X	X	X
NOAA Weather Radio Programs	Action	Existing	X	X	X	X	X	X	X				

TYPES OF MITIGATION MEASURES	Action or Project	Affects New or Existing Buildings and Infrastructure	Tornadoes	Flooding	Severe Storms	Winter Storms/Freezes	Hurricanes	Droughts/Heat Waves	Earthquakes	Wildfires	Dam/Levee Failures	Landslides	Sinkholes
NATURAL RESOURCES PROTECTION MEASURES													
Wetlands Protection	Both	Both		X				X					X
Open Space Easements and Acquisitions	Both	Both		X			X			X		X	X
River/Stream Corridor Restoration and Protection	Both	Both		X									
Urban Forestry Programs	Both	Both								X			
Water Resources Conservation Programs	Action												
Dune and Beach Restoration	Project	Both		X			X						
STRUCTURAL MEASURES													
Reservoirs	Project	Both		X									
Levees/Floodwalls	Project	Both		X							X		
Diversions	Project	Both		X									
Channel Modifications	Project	Both		X									
Dredging	Project	Both		X									
Drainage Modifications	Project	Both		X									
Storm Sewers	Project	Both		X									
Drainage System Maintenance	Project	Both		X						X			
Dam Modifications	Project	Both		X							X		
Ground Stabilization	Project	Both										X	X
Community Shelter/Safe Room Construction	Project	Both	X		X		X						

Appendix G
Committee Meeting Documentation

App. G - Committee Meeting Documentation

1.0 Establishment of Hazard Mitigation Planning Committee

The Hazard Mitigation Planning Committee (HMPC) was first established to oversee the development of the 2004 plan and was reorganized for the 2009 and 2014 plan updates. It provides opportunities for direct involvement by participating jurisdictions and interested organizations and agencies in the planning process. The HMPC convened regularly throughout the drafting phase of the 2014 plan update. The HMPC meetings served as open public forums for discussing hazard risks to Tuscaloosa County communities and developing effective strategies to respond to those risks. Meetings were publicly announced and open to public participation. Tuscaloosa County jurisdictions had direct representation on the HMPC and participated in the meetings. (See Appendix I "Multi-Jurisdictional Participation Activities".) This appendix also documents the HMPC's meeting activities during the drafting phase of this plan, including who was involved in these meetings. Included here are the meeting agendas and sign-in sheets.

2.0 Committee Meetings

The Hazard Mitigation Planning Committee met on April 14, 2014 to begin the planning process for the 2014 update. From April through October 2014, the HMPC met to complete the updates to the Tuscaloosa County Hazard Mitigation Plan, 2009 Plan Update. The meetings were held in April, June, August, September and October of 2014. During these interactive meetings, members completed written exercises related to the various components of this plan update and discussed a range of issues, among other meeting activities. These activities and discussions addressed identifying hazards, profiling hazards, examining the locations of hazards, rating the probability and extents of each hazard, assessing risk and vulnerabilities of buildings and populations, updating goals, reviewing mitigation action alternatives, and updating each community's action program. The completed exercises and results of meeting discussions were used in the formation of this plan update. All of the completed exercises are maintained on file in the Tuscaloosa County EMA offices. 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 "The Planning Process".

3.0 Meeting Agendas and Sign-in Sheets

This section documents the HMPC's meeting activities during the drafting phase of this plan, including who was involved in these meetings. Included here are the meeting agendas and sign-in sheets.

Kick-off Meeting
2014 Tuscaloosa County Multi-Hazard Mitigation Plan Update
Old Fire College Auditorium
2015 McFarland Blvd. East
(205) 349-0150

April 17, 2014
1:00 – 2:30 pm

1. Call to Order
2. Welcome and Opening Remarks
3. HMPC Appointments
4. Introduction of Consultant Team
5. Scope of Updates
6. Organization of 2014 Plan

   a. Volume I – Comprehensive Plan
      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

   b. Volume II – Community Action Programs

   c. Volume III - Appendices and Supporting Documentation

2. Review Draft Updates
   a. Introduction - Chapter 1 and App. A Federal Requirements
   b. Prerequisites - Chapter 2 and App. J Adopting Resolutions
   c. Plan Maintenance - Chapter 7

3. HMPC Exercise – Hazard Identification and Ratings
4. Meeting Dates and Topics
5. Internet Access: Website, Facebook, and e-mail
6. Questions and Answers
7. Other Business
8. Adjourn

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

April 17, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Marcia McIntosh	Citizen Corp	temcy@aol.com	205-339-4273
SARAH JOHNSTON	UNIVERSITY OF ALABAMA	SJOHNSTON@FA.UA.EDU	205-348-3801
Alonia Diaz	American Red Cross	Alonia.Diaz@redcross.org	205-394-9836
Paul Abel	DCH System	pabel@dchsystem.com	205 333-4686
DONALD KEITH	UNIV AL.	Donald.Keith@fa.ua.edu	205-348-4386
Scott Sanderford	City of Tuscaloosa-Water	SSANDERFORD@TUSCALOOSA.COM	205.349.0279
Joel Henderson	Town of Vance	jhenderson@townofvance.com	205-553-8278
ERIC LARMORE	NUCOR STEEL LEPC	ERIC.LARMORE@NUCOR.COM	205-562-1132
David Sellers	Tusc Co Bd of Ed	dsellers@tcss.net	205-242-8578
Celeste Boydston	Lehe Planning	cboydston@leheplanning	205 821 1024
Jim Lehe	"	jelehe@leheplanning.com	205-978-3633

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

April 17, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
John Powell Webb	City of Northport	jwebb@cityofnorthport.org	339-7000
JOEY OLIVE	CITY OF NORTHPORT	JOLIVE@CityofNORTHPORT.org	333-3003
Glenn Davis	EMS	gdavis@cchs.ua.edu	799-9112
Jimmy Junkin			
Scott Sandiford			
John McConnell	CITY OF TUSCALOOSA	JMCCONNELL@TUSCALOOSA.com	248-5710
David K. Martin			
Mike Henderson	Tusc Co P.W.	MHENDERSON@TUSCCO.com	205 345 6600
Tommy Dockery	ADPH area 3	[illegible]	[illegible]
Dr. Mike Daria	Tuscaloosa City Schools		
Billy Green	TCl Co EMA		

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

April 17, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Nancy Green	Congressional Coalition	[illegible]	349-2091
[illegible] Christian	City of Tuscaloosa	[illegible]	[illegible]
Martha McDow	LEPC / Gaylord Chemical	mmcdow@gaylordchem.com	205-765-3422

HMPC Meeting
2014 Tuscaloosa County Multi-Hazard Mitigation Plan Update
Old Fire College Auditorium
2015 McFarland Blvd. East
(205) 349-0150

June 26, 2014
1:00 – 2:30 pm

1. Call to Order
2. Welcome and Opening Remarks
3. http://tuscaloosa.hazardmitigationplan.com Updates
4. Review Draft Plan Updates
    a. Community Profiles – Chapter 3
    b. Risk Assessment Part A – Chapter 5A (sections 5.1-5.5)
    c. Appendix D Hazard Ratings and Descriptions
    d. Appendix E Hazard Profile Data
5. Questions and Answers
6. HMPC Exercise - HMGP Project Selection
7. Next Meeting Dates and Topics
8. Other Business
9. Adjourn

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

June 26, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
David K. Martin	Tcl Co EMA	dmartin@tuscaloosa.com	205 349 [illegible]
Jim Lehe	Lehe Planning	jelehe@leheplanning.com	205-978-[illegible]
Philip O'Leary	City of Tuscaloosa	poleary@tuscaloosa.com	205-248-5134
Dwight Rouse	Town of Coaling	townofCoaling@yahoo.com	(205) 507-0200
KEVIN BURGESS	TUSC. FIRE	KBURGESS@TUSCALOOSA.COM	248-5440
Duane Garner	Town of Brookwood	mdgarner@[illegible] charter.net	349-7131
Jerry Grady	Tusc. Co. Bd. of Ed.	jgrady@TCSS.NET	342 2853
GARY AVERETT	COALING	gaverett@tcss.net	454-9656
Alonia Diaz	The American Red Cross	Alonia.Diaz@redcross.org	394-9836
Steve Hyslin	Town of Coker	Steve@farleyandhyslin.com	534-4413
JASON Norris	Northport Fire	jnorris@cityofnorthport.org	333-3024

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

June 26, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Robert Sodda	Town of Lake View		205-477-1999
Paul Abel	DLH	pabel@dlh-systems.com	205-561-4545
Scott Sandeford	City of Tuscaloosa	ssandeford@tuscaloosa.com	205-349-0279
Joey Olive	City of Northport	jolive@cityofnorthport.org	205-333-3003
Hank McKinley	AFC	hank.mckinley@forestry.alabama.gov	205-333-1590
Ken Horst	UA	khorst@fa.ua.edu	205-348-1005
[illegible]	[illegible]	[illegible]	[illegible]
Tommy Dickey	ADPH [illegible]	[illegible]	[illegible]
Don Hartley	AEMA	don.hartley@ema.alabama.gov	334-222-8426
Jimmy Junkin	City of Tuscaloosa Water & Sewer Dept	jjunkin@tuscaloosa.com	205-248-5509
Billy Green	Tusc Co EMA	bgreen@tuscaloosa.com	205-349-0150

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

June 26, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Sandy Ebersole	Geological Survey of AL	sebersole@gsa.state.al.us	247-3613
SCOTT STEPHENS	CITY OF NORTHPORT	sstephens@cityofnorthport.org	205 339-7000
Jeff Motz	Cit of Tusc	JMotz@tusc.com	526-6951
Joel Henderson	Town of Vance	JHenderson@townofvance.com	553-8278
Randy Vaughn	Tuscaloosa PD	evaughn@tuscaloosa.com	248 4855
BRAD LANG	AL Forestry Comm	Brad.Lang@forestry.alabama.gov	333-1590
SARAH JOHNSTON	UA - OEP	sjohnston@fa.ua.edu	348-1103

2014 Tuscaloosa County Multi-Hazard Mitigation Plan Update
Old Fire College Auditorium
2015 McFarland Blvd. East
(205) 349-0150

August 14, 2014
1:00 – 2:30 pm

1. Call to Order
2. Welcome and Opening Remarks
3. http://tuscaloosa.hazardmitigationplan.com Updates
4. Review Draft Plan Updates
    a. Chapter 5 Risk Assessment Part B
5. Questions and Answers
6. Next Meeting Dates and Topics
7. Other Business
8. Adjourn

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

August 14, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Paul Abel	DCH Health System	[illegible]	205-[illegible]-4686 205-[illegible]1-4543
Daniel Wiggins	Pleasant Grove Baptist [illegible]	[illegible].net	205-[illegible] 205-[illegible]-3810
Ken Horst	UA OEP	khorst@fa.ua.edu	205-348-1005
Sarah Johnston	UA OEP	sjohnston@fa.ua.edu	205-348-1103
Alonia Diaz	American Red Cross	[illegible]@redcross.org	205-[illegible]-4896
[illegible]	Town of Coaling	townofcoaling@yahoo.com	205-507-0203
[illegible] Vaughn	Tusc PD	[illegible]	205-[illegible]-2391
Joel Henderson	Town of Vance	[illegible]@townofvance.com	205-[illegible]-8578
David Martin	Tcl Co EMA	dmartin@tuscaloosa[illegible]	205-349-[illegible]
Joey Olive	Northport City	[illegible]@cityofnorthport.org	205-333-3003
Scott Stephens	Northport	sstephens@cityofnorthport.org	[illegible]-339-7000

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

August 14, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Donald Keith	UA Emergency Prep.	donald.keith@fa.ua.edu	348-4386
Celeste Boydston	Lehe Planning LLC	[illegible]	205 331 1024
Jim Lehe	"	[illegible]	205-871-7348
John McConnell	C.U.T.	[illegible]	248 5135
Tommy Dockery	ADPH-EP	[illegible]	554-4539
Billy Green	Tusc Co [illegible]	[illegible]	[illegible]
Eric Larmore	Nucor		

2014 Tuscaloosa County Multi-Hazard Mitigation Plan Update
Old Fire College Auditorium
2015 McFarland Blvd. East
(205) 349-0150

September 18, 2014
1:00 – 2:30 pm

1. Call to Order
2. Welcome and Opening Remarks
3. http://tuscaloosa.hazardmitigationplan.com Updates
4. Review Draft Plan Updates
    a. Chapter 4 Planning Process and related appendices:
        i. Appendix G Committee Meeting Documentation
        ii. Appendix H Community Involvement Documentation
        iii. Appendix I Multi-Jurisdictional Participation Activities
    b. Chapter 6 Mitigation Strategy and related appendices
        i. Appendix B Community Mitigation Capabilities
        ii. Appendix C 2009 Plan implementation Status
        iii. Appendix F Alternative Mitigation Measures
5. HMPC Exercise: Mitigation strategy
6. Questions and Answers
7. Final Meeting Date and Topics
8. Other Business
9. Adjourn

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

September 18, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Duane Garner	Brookwood	mdgarner2@charter.net	205-344-7131
Jeff E. Johnson	Tuscaloosa	jjohnson@tusc.k12.al.us	205-759-3524
Robert Socha	Lake View	lakeBuild@comcast.net	205 [illegible] 2140
Paul Abel	DCH System	pabel@dchsystem.com	205 333-4684
Jeff Crocker	TCBOE	Jcrocker@TCSS.net	205-242-8578
Glenn Davis	Regional EMS/ADPH OEMS	gdavis@cchs.ua.edu	205-799-9112
Jason Norris	Northport Fire	jnorris@cityofnorthport.org	333-3020
Jimmy Junkin	City of Tuscaloosa	jjunkin@tuscaloosa.com	248-5501
David Hartin	Tcl Co EMA	dhartin@tuscaloosa.com	349 0150
Eric Larmore	Nucor	eric.larmore@nucor.com	205-562-1132
Donald Keith	UA Emergency Preparedness	donald.keith@ ~~[illegible]~~ fa.ua.edu	205-348-4386

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

September 18, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Steve Hysaw	Town of Coker	Steve@farleyandhysaw.com	205-534-4463
Ben Castlebery	Tuscaloosa PD	bcastleb@tuscaloosa.com	248-4850
Marcia McIntosh	American Red Cross/CC	temcy@aol.com	(205) 792-2491
JOSH YATES	CITY of TUSCALOOSA/OCE	JDYATES@TUSCALOOSA.com	(205) 248-5387
Joel Henderson	Town of Vance	JHenderson@townofVance.com	(205) 553-8278
Casey Rice	Hunt	crice@huntrefining.com	205 464 4141
Jeff Motz	City of Tusc	JMotz@Tuscaloosa.com	826-6981
SCOTT STEPHENS	CITY OF NORTHPORT	sstephens@cityofnorthport.org	339-7000
John Powell Webb	City of Northport	jwebb@cityofnorthport.org	339-7000
Nancy Green	Compassion Coalition	green77@pobox.com	349-2797
SARAH JOHNSTON	UA OEP	SJOHNSTON@FA.UA.EDU	348-1108

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

September 18, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Heath Smitherman	NPD	hsmitherman@ City of Northport. org	205 469-1381
Tommy Dockery	ADPH - Emergency Preparedness	tommy.dockery@adph.state.al.us	554-4539
Jim Lehe	Lehe Plan	-	-

2014 Tuscaloosa County Multi-Hazard Mitigation Plan Update

Tuscaloosa County Extension Service Auditorium
2513 7th Street, Tuscaloosa, AL 35401
(205) 349-0150

October 16, 2014
1:45 – 3:00 pm

1. Call to Order
2. Welcome and Opening Remarks
3. http://tuscaloosa.hazardmitigationplan.com Updates
4. Review Draft Plan Updates

   Part II. Community Action Programs (final section of plan)
5. FEMA Approval Procedures
6. Local Plan Adoption
7. Questions and Answers
8. Other Business
9. Adjourn

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

October 16, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Jimmy Junkin	City of Tuscaloosa	jjunkin@tuscaloosa.com	248-5508
Marcia McIntosh	American Red Cross	temcy@aol.com	792-2491
Jessica L. Tiamore	Taylor Hardin Secure Medical	jessica.tidmore@hardin.mh.alabama.gov	391-7114
Kevin Plybrook	Coaling Fire Dist	mayberry fd@aol.com	393-3276
Tommy Dockery	ADPH - Emergency Preparedness	tommy.dockery@adph.state.al.us	554-4539
Sarah Johnston	UA - DEP	SJOHNSTON@FA.UA.EDU	205-348-1103
Ken Horst	UA - DEP	khorst@fa.ua.edu	205-348-1005
Joely Olive	City of Northport	JOLIVE@CITYOFNORTHPORT.ORG	205-333-3003
Scott Stephens	"	sstephens@cityofnorthport.org	205-339-7000
Bruce Wade	Town of Lake View	mayor@townoflakeview.net	205-789-1113
[illegible]	Town of Coaling	townofcoaling@yahoo.com	205-507-[illegible]

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

October 16, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
John Powell Webb	City of Northport	jwebb@cityofnorthport.org	339-7000
Jim Leke	Leke Planning	jeleke@lekeplanning.com	918-3637
MARK GLENN	CITY OF NORTHPORT PD	MGLENN@CITYOFNORTHPORT.ORG	469-1380
JESSE E. JOHNSON	TUSCALOOSA CITY SCHOOLS	jjohnson@tusc.k12.al.	759-3524
Jason Grady	Tuscaloosa Co Bd of Ed	jgrady@TCSS.NET	342-2893
Rick Wilkinson	Northport Fire	rickwilkinson@cityofnorthport.org	333-3020
Casey Rice	Hunt Refining	crice@huntrefining.com	464-4141
David Martin	Tuscaloosa Co EMA	dhartin@tuscaloosa.com	349-0150
JOHN MCCONNELL	CITY OF TUSCALOOSA	JMCCONNELL@TUSCALOOSA.COM	248-5135
Edward Vaugh	Tusc PD	evaughn@tuscaloosa.com	248-4850
Jeff Motz	City of Tuscaloosa	jmotz@tuscaloosa.com	826-6981

Tuscaloosa County

Hazard Mitigation Planning Committee Meeting

October 16, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Rob Stringfellow	ALDOT	stringfellowr@dot.state.al.us	554-3297
KEITH DALY	ALDOT	dalyk@dot.state.al.us	507-4499
KEVIN BURGESS	TFRS	KBURGESS@TUSCALOOSA.COM	248-5440
Mike Montgomery	TFRS	mmontgom@tuscaloosa.com	361-1147
Nancy Green	TC VOAD	green11@pobox.com	349-2797

Appendix H
Community Involvement Documentation

App. H - Community Involvement Documentation

1.0 Community Involvement Opportunities

This Appendix includes additional documentation of the community involvement opportunities in the planning process for the Tuscaloosa County 2014 plan update, which are summarized below. (See Chapter 4 “Planning Process” for a complete discussion of community involvement in the planning process).

1. The Tuscaloosa County Hazard Mitigation Planning Committee (HMPC). The Committee was first established in 2004 and made up of LEPC members and they oversaw development of the original plan. It was reorganized in 2008 to include other members from such departments as the county engineering department to oversee the 2009 update. In March 2014, the current HMPC was invited to participate in this update. The HMPC’s primary purposes are to oversee all hazard mitigation planning activities and ensure the plan’s ongoing monitoring and implementation. The HMPC represents all Tuscaloosa County jurisdictions, as well as interested stakeholder organizations, and meets at least annually. Its four meetings during the drafting phase of the 2014 plan update were publicly announced and open to public attendance and participation. (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 2014 Tuscaloosa County Multi-Hazard Mitigation Plan Website. The website tuscaloosa.hazardmitigationplan.com was active during the drafting phase of the 2014 update. The website was created to encourage “the public, government agencies, colleges and universities, neighboring jurisdictions, businesses and industries and others concerned with hazard mitigation to become involved in the process of updating the 2014 Tuscaloosa County, Alabama, Multi-Hazard Mitigation Plan.” The website contained the most recent draft sections of the plan, meeting materials including presentation materials and encouraged public comments through an email account at tuscaloosa@hazardmitigationplan.com. The public could also contact the planning team through Facebook and Twitter. The website provided public information on the HMPC membership, meeting announcements, and contact information for the Tuscaloosa County EMA and the consulting team. The most recently adopted plan is maintained at the Tuscaloosa County EMA’s website. The website address is: http://www.tuscaloosa.com/Government/Departments/Emergency-management/emergency-management.

3. Community Event. The HMPC held a community event as part of Tuscaloosa's "Be Ready Day" on September 11, 2014. The event was an open house style venue with handouts, the draft plan, surveys and exhibits throughout the room. "Be Ready Day" was announced on the local radio stations and in the newspaper. The local TV and radio stations and newspaper covered the event. Copies of the survey from the open house, sign-in sheets and the newspaper announcement are included in this appendix.

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. A final opportunity for public comment was afforded immediately before adoption by each local governing body. Following the close for public comments, the plan was adopted by the governing bodies of each jurisdiction.

6. Tuscaloosa County EMA Community Relations. The Director and staff of the Tuscaloosa County EMA have a longstanding record of strong and effective community relations, which further facilitated community interest and involvement in the 2014 plan update.

2.0 Documentation

This Appendix includes the following documentation of community involvement activities and opportunities:

- An image of the 2014 Tuscaloosa County Multi-Hazard plan update website at http://tuscaloosa.hazardmitigationplan.com .
- The public outreach survey form.
- The media release for the open house event.
- A copy of the local news announcement of the open house event.
- Sign-in sheets documenting attendance at the community event.
- The notification sent to interested agencies, organizations, and stakeholders to review the plan.

HOME ABOUT SERVICES CONTACT

Hazard Mitigation Planning

2014 Tuscaloosa County
Multi-Hazard Mitigation Plan

The Tuscaloosa County Hazard Mitigation Planning Committee encourages the public, government agencies, colleges and universities, neighboring jurisdictions, businesses and industries, and others concerned with hazard mitigation to become involved in the process of updating the 2014 Tuscaloosa County, Alabama, Multi-Hazard Mitigation Plan. Please review the information presented here and contribute your ideas and recommendations for planning to make Tuscaloosa County communities safer communities.

What is the 2014 plan update?

The 2014 Plan is a multi-jurisdictional guide for all Tuscaloosa County communities. Participating jurisdictions include all unincorporated areas, the Towns of Brookwood, Coaling, Coker, Lake View, Moundville, Vance, and Woodstock and the Cities of Northport and Tuscaloosa. Other participants include the Tuscaloosa County and City School Boards, and the Tuscaloosa County Fire Association. It 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 planning process began in 2004 with the appointment of the Hazard Mitigation Planning Committee (HMPC) by the EMA Director. The HMPC guided the preparation of the initial 2005 Tuscaloosa County Hazard Mitigation Plan plan, which was drafted by the West Alabama Regional Commission (WARC). The plan was subsequently approved by FEMA and adopted by the County Commission and the governing bodies of all participating municipalities. The HMPC reconvened in 2007 to update the 2004 plan as the 2009 Tuscaloosa County Hazard Mitigation Plan with WARC assistance. The 2009 plan was adopted locally and approved by FEMA on October 13, 2009. The HMPC has again reconvened for this 2014 update, which continues the unified approach among all Tuscaloosa County communities to guide their ongoing efforts to mitigate vulnerabilities.

The Tuscaloosa County Hazard Mitigation Planning Committee

The Hazard Mitigation Planning Committee convenes regularly to oversee the drafting of the 2014 plan update. Meetings are held at the Tuscaloosa County EMA and are open to the public and all interested agencies. A community meeting will be held during the final drafting stage of the plan to provide additional opportunities for public review and comment. Committee representatives participate in plan exercises and other activities throughout the planning process. In the end, the Hazard Mitigation Planning Committee will approve the final draft plan and recommend its adoption to all participating jurisdictions and agencies.

HMPC Meeting Schedule

Thursday, April 17, 2014 at 1 PM: click here for agenda, Hazard Identification and Ratings Exercise, and slide presentation
Thursday, June 26, 2014 at 1 PM: click here for agenda, HMGP Project Selection Exercise, and slide presentation
Thursday, August 14, 2014 at 1 PM: click here for agenda and slide presentation

Community Meeting
Thursday, September 11, 2014 from 5 to 7 PM: click here for Community Survey
Be Ready Day – Old Alabama Fire College & Old Tuscaloosa Fire & Rescue Training/Logistics Facility
2015 McFarland Blvd East

The 2014 Tuscaloosa County Multi-Hazard Mitigation Plan (DRAFT Elements)

The plan elements listed below, with a hyperlink, are presented here for public review and comment, as they are completed. Please review the plan as it is drafted and email your comments and suggestions to us at tuscaloosa@hazardmitigationplan.com.

Part I. Multi-Hazard Mitigation Plan
- Cover and Title Page
- Chapter 1 Introduction
- Chapter 2 Prerequisites
- Chapter 3 Community Profiles
- Chapter 4 Planning Process
- Chapter 5A Risk Assessment
- Chapter 5B Risk Assessment
- Chapter 6 Mitigation Strategy
- Chapter 7 Plan Maintenance Process

Part II. Community Action Programs

Part III. Appendices
- Appendix A Federal Requirements for Local Mitigation Plans
- Appendix B Community Mitigation Capabilities
- Appendix C 2009 Plan Implementation Status
- Appendix D Hazard Ratings and Descriptions
- Appendix E Hazard Profile Data
- Appendix F Alternative Mitigation Measures
- Appendix G Committee Meeting Documentation
- Appendix H Community Involvement Documentation
- Appendix I Multi-Jurisdictional Participation Activities
- Appendix J Adopting Resolution

Tuscaloosa County Community Meeting
2014 Tuscaloosa County Multi-Hazard Mitigation Plan

Name of your community:____

Of the following hazards, circle the ones that are of most concern to you.

Severe Storms	Hurricanes
Tornadoes	Sinkholes
Floods	Landslides
Droughts/Heat Waves	Wildfires
Winter Storms/Freezes	Earthquakes
Dam/Levee Failures	Manmade & Technological Hazards

Do you have any specific concerns for any of the above hazards?

____

____

____

____

Do you have any recommendations on how to mitigate (lessen the effects of) one or more of the above hazards?

____

____

____

____

Thank you for your comments.

Tuscaloosa County Emergency Management Agency

MEDIA NOTIFICATION

FOR IMMEDIATE RELEASE

DATE: September 8, 2014

CONTACT: David Hartin, Director
Tuscaloosa County EMA
(205) 349-0150
dhartin@tuscaloosa.com

Tuscaloosa Be Ready Day: HMPC Seeking Input on Hazard Mitigation Plan

The Tuscaloosa County Hazard Mitigation Planning Committee (HMPC), as part of Be Ready Day, is asking for community input on the update of the Tuscaloosa County Multi-Hazard Mitigation Plan. The community event is part of a five-year plan update process to inform the public of and obtain input on changes made to the plan. Through a comprehensive planning process and risk assessment, the plan creates a unified approach among Tuscaloosa communities for dealing with identified hazards and associated risk issues. It serves as a guide for Tuscaloosa County to reduce community vulnerabilities.

The HMPC effort, in conjunction with the Tuscaloosa Sheriff's Office Be Ready Day event, is scheduled for Thursday, September 11 from 5 to 7 pm. It is being held in the auditorium of the Old Alabama Fire College and Old Tuscaloosa Fire & Rescue Training/Logistics Facility, located at 2015 McFarland Boulevard East.

The HMPC will have maps, tables, and information from the 2014 plan update on display in the auditorium. The HMPC is asking community members to fill out a survey, which will be made available at the event and also available via the plan's website tuscaloosa.hazardmitigationplan.com. Interested parties can also view and download completed draft chapters from the website. In addition, various FEMA publications and resources will be available at the event.

David Hartin, Director of the Tuscaloosa Emergency Management Agency, is leading the plan update in coordination with the selected planning consulting firm, Lehe Planning, LLC. For additional information regarding the update of the Tuscaloosa County Multi-Hazard Mitigation Plan, contact David Hartin directly at 205-349-0150 or dhartin@tuscaloosa.com.

# # #

Tuscaloosanews.com

'Be Ready Day' event scheduled Thursday

Staff report
Published: Tuesday, September 9, 2014 at 11:00 p.m.

Members of the public are invited to attend the annual "Be Ready Day" event scheduled for Thursday.

Law enforcement, emergency response and volunteer agencies are hosting the event at the Tuscaloosa County Emergency Management Agency facility, 2015 McFarland Blvd. E., in front of the former Bruno's supermarket.

Equipment used in disaster and emergency responses will be on display, and emergency personnel will be there to speak with the public. People can learn how to assemble a disaster preparation kit for their homes.

The Tuscaloosa County Hazard Mitigation Planning Committee is asking for public input as the members update the county's multihazard mitigation plan. The plan is intended to create a unified approach among Tuscaloosa communities for dealing with identified hazards and associated risk issues, said Tuscaloosa County Emergency Management Agency director David Hartin.

The committee will have maps, tables and information from the 2014 plan update on display in the auditorium. Community members can complete a survey at the event or at tuscaloosa.hazardmitigationplan.com.

The event will last from 5 to 7 p.m. Free hot dogs, pizza and soft drinks will be served.

Tuscaloosa County

Be Ready Day Event

September 11, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Marcia McIntosh	LEPC	tenccy@aol.com	205-792-2491
Beakie Powell	ARC	beakiep@gmail.com	205-758-3608
Bev Leigh, III	ARC	bev.Leigh@att.net	799-0649
Caroline Cockrell	Red Cross	gccockrell@crimson.ua.edu	205 752-6525
Ginger Cockrell	Red Cross	gingercockrell@yahoo.com	205 349-2009
Lathon A. Reilly	Community Member	Kelapape@comcast.net	205-248-8312
Payton Reilly	Community Member	Kelapape@comcast.net	205-248-8312
Keith Reilly	Community Member	reilly01@comcast.net	2052488312
Scotch Ritchey	gsritchey@crimson.ua.edu	red cross	205752-6525
David Martin	Tuscaloosa Co. EMA	dmartin@tuscaloosa.com	205 3490150
Dwayne McIntosh	ARC	Temcy@AOL.com	2053491048

Tuscaloosa County

Be Ready Day Event

September 11, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Phillip Johnson	Duncanville Englewood-Hulls Vol Fire	pjohnson8304@att.net	205-345-8304
Robert Stone	Englewood-Hulls Vol. Fire	r.stone8@att.net	205-535-8224
Tommy Dockery	ADPH - EP	tommy.dockery@adph.state.al.us	554-4539
Amy Branch	citizen		
Lisa Marshall Thomas	TPD	lmarshal@tuscaloosa.com	(205) 248-4830
~~Patty Gibbons~~			
Alonia Diaz	American Red Cross	Alonia.Diaz AOL.com	(205) 394-9836
MAJOR Mike Camp	Civil Air Patrol	MACAMCAP@	333-2608
Donald Sanford	Focus		205-553-5772
Joel Henderson	Town of Vance	JHenderson@townofVance.com	205-553-8278
Sandy Gordon	Tuscaloosa	pashagordon@bellsouth.net	205-553-224

Tuscaloosa County

Be Ready Day Event

September 11, 2014

Name	Jurisdiction/Organization	Email Address	Phone Number
Terry Brown	Tuscaloosa County EMA		
Jennifier Brown	Tuscaloosa County EMA		
Rusty Hoyt	Tusc Co Ema	Rusty.hoyt@gmail.com	507 1160
Michael H. Krueger	Tuscaloosa Co.	MHKRUEGER1@comcast.net	310-1052
Eddie Lary	Tusc. Co. EMA	eLary@Hughes.net	
Tim Chism		timchismcoa@bellsouth.net	394-0037
Kevin Lybrook	Coaling Fire ~~Tusc Co EMA~~	MAYBERRYFD@Aol.com	393-3276
Lynn Lybrook	Coaling Fire " "	" "	" "
Nancy Green	Compassion Coalition	green11@pobox.com	561-4048
Ethan Barrett	Alabama Forestry Comm	Hale.County@forestry.alabama.gov	
Ronnie Turner	" " "		
Jim Lehe	Lake Planning		

Email to area agencies from the planning team about the ability to review the plan online and to submit comments:

From: Kay Jones
Sent: Friday, September 19, 2014 at 11:20 am
To:
Subject: 2014 Tuscaloosa County Multi-Hazard Mitigation Plan Update Review

To all concerned:

We have concluded the drafting of the update to the 2014 Tuscaloosa County Multi-Hazard Mitigation Plan and would like to invite you to review the plan and provide any additional information or comments you may have pertinent to the mitigation measures set forth in the plan.

The Tuscaloosa County Hazard Mitigation Planning Committee met from April through September 2014 to update the 2009 plan and is ready to submit it to the state EMA office for their review and approval.

You can find the entire plan at tuscaloosa.hazardmitigationplan.com and may provide any feedback you have to us at tuscaloosa@hazardmitigationplan.com.

We appreciate your participation in this planning process.

Kay Jones
Project Administrator

Lehe Planning, LLC
300 Century Park South, Ste. 216
Birmingham, AL 35226-3924

Woodstock notification email:

From: Kay Jones <kayjones@leheplanning.com>
Sent: Wednesday, February 25, 2015 11:21 AM
To: townofwoodstock@aol.com
Cc: Jim Lehe; rrobertson@tuscco.com; dhartin@tuscaloosa.com
Subject: 2014 Tuscaloosa County Multi-Hazard Mitigation Plan Update Review

Dear Mayor Kornegay:

We have concluded the drafting of the update to the 2014 Tuscaloosa County Multi-Hazard Mitigation Plan and would like to invite you to review the plan and provide any additional information or comments you may have.

The Tuscaloosa County Hazard Mitigation Planning Committee met from April through October 2014 to update the 2009 plan. It has been sent to the Alabama EMA for their review and recommendation to FEMA for final approval.

You can find the entire plan at http://tuscaloosa.hazardmitigationplan.com and may provide any feedback you have directly to me.

To be eligible for FEMA grant funds, your town will need to participate in and adopt the Bibb County Plan. Although your (town/city) partially lies within Tuscaloosa County, your primary location is within Bibb County.

If you have any questions, please let me know.

Thank you for any contributions you may make to the Tuscaloosa County plan.

Kay Jones
Project Administrator

Lehe Planning, LLC
300 Century Park South, Ste. 216
Birmingham, AL 35226
Phone: 205-978-3633
Fax: 205-978.3634

Moundville notification email:

From: Kay Jones <kayjones@leheplanning.com>
Sent: Wednesday, February 25, 2015 11:19 AM
To: tonylester@mound.net
Cc: Jim Lehe; rrobertson@tuscco.com; dhartin@tuscaloosa.com
Subject: 2014 Tuscaloosa County Multi-Hazard Plan Update Review

Dear Mayor Lester:

We have concluded the drafting of the update to the 2014 Tuscaloosa County Multi-Hazard Mitigation Plan and would like to invite you to review the plan and provide any additional information or comments you may have.

The Tuscaloosa County Hazard Mitigation Planning Committee met from April through October 2014 to update the 2009 plan. It has been sent to the Alabama EMA for their review and recommendation to FEMA for final approval.

You can find the entire plan at http://tuscaloosa.hazardmitigationplan.com and may provide any feedback you have directly to me.

To be eligible for FEMA grant funds, your town will need to participate in and adopt the Hale County Plan. Although your (town/city) partially lies within Tuscaloosa County, your primary location is within Hale County.

If you have any questions, please let me know.

Thank you for any contributions you may make to the Tuscaloosa County plan.

Kay Jones
Project Administrator

Lehe Planning, LLC
300 Century Park South, Ste. 216
Birmingham, AL 35226
Phone: 205-978-3633
Fax: 205-978.3634

Appendix I
Multi-Jurisdictional Participation Activities

App. I -Multi-Jurisdictional Participation Activities

1.0 Participation Requirements

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…" The table in this Appendix illustrates each jurisdiction's participation within Tuscaloosa County in the plan update; qualifying it as a Multi-Jurisdictional Plan.

Hazard Mitigation Planning Committee (HMPC) members were afforded many opportunities to participate in every step of the plan update, from the kick-off meeting on April 14, 2014 to the public hearings preceding adoption of the resolutions by the governing bodies. Table I-1 "Multi-Jurisdictional Participation Activities" notes those jurisdictions participating as independent local governments, i.e., the county, cities, and towns. Whenever a representative was unable to attend a meeting, all meeting materials (agendas, handouts, Power Point presentation, and committee exercises) were transmitted to the absent individual by email and through the project website at http://tuscaloosa.hazardmitigaitonplan.com.

In addition to participation in HMPC meetings, all jurisdictions completed all of the planning exercises, which can be found at the end of this appendix.

2.0 Participation Documentation

Table I-1 included in this Appendix lists each jurisdiction within Tuscaloosa County and the various meetings and activities that each jurisdiction could participate in. An X indicates the events in which the jurisdiction chose to participate. Examples and conclusions of the activities are shown in Appendices B through F, and information on the meetings is included in Chapter 4 and Appendices G and H.

Table I-1. Multi-Jurisdictional Participation Activities

Multi-Jurisdictional Participation Activities Tuscaloosa County 2014 Plan Update	Tuscaloosa Co.	Brookwood	Coaling	Coker	Lake View	Northport	Tuscaloosa	Vance
HMPC Kick-off Meeting - April 14, 2014	X					X	X	X
Hazard Identification and Ratings	X	X	X	X	X	X	X	X
HMPC Meeting 2 –June 26, 2014	X	X	X	X	X	X	X	X
Hazard Mitigation Project Selection	X	X	X	X	X	X	X	X
HMPC Meeting 3 –August 14, 2014	X		X			X	X	X
HMPC Meeting 4 –September 18, 2014	X	X		X	X	X	X	X
Multi-Jurisdiction Mitigation Action Program	X	X	X	X	X	X	X	X
HMPC Meeting 5–October 16, 2014	X	X	X	X	X	X	X	X

X Denotes participation in activity

3.0 HMPC Exercises

The HMPC Exercises included in this section have been completed by all participating jurisdictions, school boards, and other interested stakeholders that serve on the Hazard Mitigation Planning Committee (HMPC). The results have been compiled and incorporated into the contents throughout this plan. Included here are the following exercises:

(1) **HMPC Hazard Identification and Ratings Exercise.** The results of this exercise have been incorporated into Chapter 5 “Risk Assessment” hazard identifications and profiles in Sections 5.3 and 5.4.

(2) **HMPC Exercises: HMGP Project Selection, Parts I and II.** The results of these exercises influenced the selection of mitigation measures in the “Community Action Programs.”

(3) Multi-Jurisdictional Mitigation Action Program Exercise. This exercise was used to develop the “Community Action Programs” for each jurisdiction.

Tuscaloosa County 2014 Multi-Hazard Mitigation Plan Update

HMPC Hazard Identification and Ratings Exercise

Completed by (insert your name and title):____

Representing (insert your organization):____

Today's date:____

Instructions. Please complete the ratings for your jurisdiction(s) of interest, according to the following key.

Key:

LOCATION - WHETHER THE JURISDICTION IS AFFECTED BY THE HAZARD
1 = YES
0 = NO
PROBABILITY - THE LIKELIHOOD THAT THE HAZARD WOULD OCCUR IN THIS JURSIDICTION
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

Hazard Identification and Ratings Exercise

Hazard	Geographic Area	Location (2014)	Probability (2014)	Extent (2014)
Tornadoes	Tuscaloosa County			
	Brookwood			
	Coaling			
	Coker			
	Lake View			
	Moundville			
	Northport			
	Tuscaloosa			
	Vance			
	Woodstock			
Severe Storms	Tuscaloosa County			
	Brookwood			
	Coaling			
	Coker			
	Lake View			
	Moundville			
	Northport			
	Tuscaloosa			
	Vance			

Hazard	Geographic Area	Location (2014)	Probability (2014)	Extent (2014)
	Woodstock			
Floods	Tuscaloosa County			
	Brookwood			
	Coaling			
	Coker			
	Lake View			
	Moundville			
	Northport			
	Tuscaloosa			
	Vance			
	Woodstock			
Winter storms/freezes	Tuscaloosa County			
	Brookwood			
	Coaling			
	Coker			
	Lake View			
	Moundville			
	Northport			
	Tuscaloosa			
	Vance			

Hazard	Geographic Area	Location (2014)	Probability (2014)	Extent (2014)
	Woodstock			
Hurricanes	Tuscaloosa County			
	Brookwood			
	Coaling			
	Coker			
	Lake View			
	Moundville			
	Northport			
	Tuscaloosa			
	Vance			
	Woodstock			
Droughts/Heat Waves	Tuscaloosa County			
	Brookwood			
	Coaling			
	Coker			
	Lake View			
	Moundville			
	Northport			
	Tuscaloosa			
	Vance			

Hazard	Geographic Area	Location (2014)	Probability (2014)	Extent (2014)
	Woodstock			
Wildfires	Tuscaloosa County			
	Brookwood			
	Coaling			
	Coker			
	Lake View			
	Moundville			
	Northport			
	Tuscaloosa			
	Vance			
	Woodstock			
Dam/levee failures	Tuscaloosa County			
	Brookwood			
	Coaling			
	Coker			
	Lake View			
	Moundville			
	Northport			
	Tuscaloosa			
	Vance			

Hazard	Geographic Area	Location (2014)	Probability (2014)	Extent (2014)
	Woodstock			
Landslides	Tuscaloosa County			
Landslides (cont'd.)	Brookwood			
	Coaling			
	Coker			
	Lake View			
	Moundville			
	Northport			
	Tuscaloosa			
	Vance			
	Woodstock			
Earthquakes	Tuscaloosa County			
	Brookwood			
	Coaling			
	Coker			
	Lake View			
	Moundville			
	Northport			
	Tuscaloosa			
	Vance			

Hazard	Geographic Area	Location (2014)	Probability (2014)	Extent (2014)
	Woodstock			
Sinkholes	Tuscaloosa County			
	Brookwood			
	Coaling			
	Coker			
	Lake View			
	Moundville			
	Northport			
	Tuscaloosa			
	Vance			
	Woodstock			
Manmade and Technological	Tuscaloosa County			
	Brookwood			
	Coaling			
	Coker			
	Lake View			
	Moundville			
	Northport			
	Tuscaloosa			
	Vance			

Hazard	Geographic Area	Location (2014)	Probability (2014)	Extent (2014)
	Woodstock			

Comments:

2014 Tuscaloosa County Multi-Hazard Mitigation Plan Update

HMPC Exercise: HMGP Project Selection, Part I

Instructions. Please complete this exercise as a group at the end of an HMPC meeting.

The Scenario. A Presidential Disaster Declaration for flooding, high winds, severe storms, and tornadoes that recently affected your County has been issued. Your County EMA Director has been informed by the Alabama EMA that as a result of the declaration, the State has set aside up to $3 million in FEMA Hazard Mitigation Grant (HMGP) funds for eligible applicants (state agencies, local governments, school boards, and private non-profit agencies) within your County.

HMGP applications for all types of eligible mitigation projects will be considered from all eligible applicants. The HMGP grant can provide 75% funding of the project (up to $3 million) and your County Commission has budgeted up to $1 million to meet the required local match. The $4 million can be spent on a single project or multiple projects.

To be eligible, hazard mitigation projects must be cost effective and technically feasible and be consistent with the goals, objectives, and mitigation measures in your community's mitigation plan. In anticipation of funds becoming available, your community or agency has already developed one or more projects that are technically feasible and exceed a 1.0 Benefit-to-Cost Ratio (BCR).

The BCR is a number greater than 1.0 that shows the total project costs in comparison to the expected damage reduction over the life of the project. For example, a $500,000 flood hazard mitigation project that reduces damages to 10 homes by $1,000,000 over a 50 year period would have a BCR of 2.0 or for every $1 spent. A 2.0 BCR means there should be $2 less flooding damages to the homes for each $1 spent. For purposes of this exercise, a Low BCR is between 1.1 and 1.5, a Medium BCR is between 1.6 and 2.5, and a High BCR is above 2.5.

The project must result in a sustained action that reduces or eliminates long-term risk to people and property from natural hazards and their effects. Projects to be considered for funding under the HMGP include the following eligible types:

- **Property Acquisition and Structure Demolition or Relocation –** The voluntary acquisition of an existing at-risk structure within a flood hazard area and the underlying land, and conversion of the land to open space through the demolition or relocation of the structure to an area outside of a hazard-prone area.
- **Structure Elevation –** Physically raising an existing structure above its flood elevation.
- **Dry Floodproofing –** Techniques applied to keep nonresidential structures dry by sealing the structure to keep floodwaters out.

- **Generators –** Generators are emergency equipment that provide a secondary source of power to a critical facility, such as water and sewer facilities, fire and police stations, and hospitals.
- **Minor Localized Flood Reduction–** Structural projects to lessen flood damages, such as channel improvements, culvert installation or modifications, creation of detention basins.
- **Structural Retrofitting of Existing Buildings –** Modifications to the structural elements of a building to reduce or eliminate the risk of future damage from any natural disaster (high winds, landslides, earthquakes, sinkholes, freezes, etc.) and to protect inhabitants.
- **Non-structural Retrofitting of Existing Buildings and Facilities –** Modifications to the non-structural elements of a building or facility to reduce or eliminate the risk of future damage and to protect inhabitants, such as, bracing of building contents to prevent earthquake damage or the elevation of utilities.
- **Safe Room Construction –** Safe room construction projects are designed to provide immediate life-safety protection for people in public and private structures from tornado and severe wind events, including hurricanes. These projects include community safe rooms, dual purpose community safe rooms, and individual safe rooms.
- **Wind Retrofit–** Wind retrofit projects are designed to protect buildings from high winds, using roof braces, shutters, and other methods.
- **Infrastructure Retrofit –** Measures to reduce risk to existing utility systems, roads, and bridges.
- **Soil Stabilization –** Projects to reduce risk to structures or infrastructure from erosion and landslides, including installing geotextiles, stabilizing sod, installing vegetative buffer strips, preserving mature vegetation, decreasing slope angles, and stabilizing with rip rap and other means of slope anchoring.
- **Wildfire Mitigation** – Projects to mitigate at-risk structures and associated loss of life from the threat of future wildfire through such methods as, creating perimeters around homes, structures, and critical facilities through the removal or reduction of flammable vegetation; applying ignition-resistant techniques and/or non-combustible materials on new and existing homes, structures, and critical facilities; and removing vegetative fuels proximate to at-risk structures that, if ignited, pose significant threat to human life and property, especially critical facilities.
- **Post-Disaster Code Enforcement –** Projects designed to support the post-disaster rebuilding effort by ensuring that sufficient expertise is on hand to ensure appropriate codes and standards, including NFIP local ordinance requirements, are used and enforced.

What project(s) will you submit? You are ready to submit one or more HMGP applications for eligible projects. Name and briefly describe the project(s) with the estimated cost and expected BCR using the form on the next page. Use a separate form for each project, and if more than one project is submitted, prioritize each. The total cost of all projects within the County must not exceed $4 million, and your County Hazard Mitigation Planning Committee will recommend one or more priority projects to the Alabama EMA for funding within your County's HMGP funding allotment.

Project Title

____

Name of Eligible Applicant:____

Project Type:____

Estimated Total Project Cost: $_______________

Expected Benefit-Cost Ratio: _____ Low _____ Medium _____ High

Is project consistent with community's mitigation plan?

Project Description:

2014 Tuscaloosa County Multi-Hazard Mitigation Plan Update

HMPC Exercise: HMGP Project Selection, Part 2

Instructions. Please complete one exercise per project.

The Scenario. In Part 1 of this Project Selection HMPC Exercise, you identified one or more eligible projects for your jurisdiction. Your project has been forwarded to the HMPC for review and prioritization. As a representative on the HMPC, you now need to review and prioritize each project. In order to do this, you will review the project information and assign a score to the project using the table attached. In the end, all scores will be tabulated, and the HMPC will decide how the $3 million allotment will be distributed within your county.

Eligibility. You should first review the project description to determine if it's eligible. If not, the project is eliminated from further consideration. Please refer to the instructions in Part 1 of this exercise to determine project eligibility.

You should also verify applicant eligibility and location of the project within an eligible community. An eligible community must be a (a) member in good standing in the NFIP and (b) participate in and adopt an approved hazard mitigation plan. If both of these conditions are not met, the applicant will be ineligible to apply for any funding, and the project must be eliminated from further consideration.

Rating Criteria. Once you have determined eligibility, rate the project according to the following described criteria:

(1) *Consistency with Local Mitigation Plan.* A project must be consistent with the goals, objectives, and mitigation measures of the local mitigation plan, as presented in the Community's Mitigation Action Program. This means that the project should be based upon a related mitigation measure that can be clearly identified in the Mitigation Action Program. Once you have identified the related measure, you must then rate the degree of consistency by considering the priority assigned to the related mitigation measure – high, medium or low priority. If a project is not consistent with the approved plan, the HMPC can amend the plan. Please note the project does not have to be specifically listed in the plan; the rule is that it must be consistent with the goals, objectives, and one or more mitigation measures. For example, the project may call for buying three flooded homes on Pine Street, and the Action Program includes a mitigation measure to "acquire properties at high flood risk to eliminate future damages."

(2) *Consistency with Risk Assessment.* Chapter 5 of the plan includes a risk assessment of all possible hazards, and the HMPC has ranked the probability and severity of each identified hazard, as part of the planning process. Weight will be given to projects that address higher risk hazards. You should use the Chapter 5 assessments and the ratings provided in Appendix D as resources to determine what score each project should receive.

(3) *Preferred Project Type.* When a notice of funding availability is provided by either FEMA or AEMA, preferred projects may be identified and are typically based on either the funding source or type of event, which provided the funding. The preferred project types will be provided by the agency when funding is announced. In our scenario, the Presidential Disaster Declaration is for flooding, high winds, severe storms, and tornadoes, and mitigation projects related to these disasters are preferred.

(4) *Local Capabilities.* This is a measure of the applicant's capabilities to implement the project and meet the minimum required match through cash or in-kind services.

(5) *Cost Effectiveness.* In order for a project to be eligible for any HMA funding, the dollar return (as measured in reduced damages or casualties) must outweigh the project costs. This is measured by a Benefit Cost Analysis that must be completed when an application is submitted for funding. When you review this application for initial prioritization and eligibility, you may not have all of the details in order to determine the true BCR (Benefit-Cost Ratio). You should use the measures included in the Part I form - Low, Medium, or High - to determine the cost effectiveness.

(6) *Reduced Vulnerability of Critical Facilities.* Projects that reduce the vulnerability of public, critical facilities are encouraged. The score should be based on the type and number critical facilities that benefit from the project. Examples of public critical facilities would be fire and police stations, government offices, sewer lift stations, and water and sewer treatment plants.

(7) *Elimination of Hazard.* Some projects, primarily acquisitions, may eliminate threat of hazard entirely, while others significantly or slightly reduce the effects of a hazard.

Project Title

____

FACTOR	WEIGHT	POINTS	STANDARD	SCORE (WEIGHT X POINTS)
Consistency with Mitigation Action Program	10%	100	Fully consistent	
		50	Somewhat consistent	
		0	Not consistent, requires plan amendment	
Consistency with Risk Assessment	15%	100	Addresses highest risk hazard(s)	
		60	Addresses moderate risk hazard(s)	
		30	Addresses slight risk hazard(s)	
Preferred Project Type	15%	100	Preferred project type	
		30	Somewhat preferred project type	
		0	Not a preferred project type	
Local Capabilities	15%	100	High	
		50	Medium	
		10	Low	
Cost Effectiveness (BCR)	20%	100	High	

FACTOR	WEIGHT	POINTS	STANDARD	SCORE (WEIGHT X POINTS)
		50	Medium	
		10	Low	
Reduced Vulnerability of Critical Facilities	10%	100	Vulnerability of two or more critical facilities reduced	
		70	Vulnerability of at least one critical facility reduced	
		0	No benefit to any critical facilities	
Elimination of Hazard	15%	100	Project entirely eliminates threat of hazard to property	
		70	Project significantly reduces but does not eliminate threat of hazard	
		10	Project slightly reduces the threat of hazard	
TOTAL PROJECT SCORE	100%		*(100 maximum points)*	

Multi-Jurisdictional Mitigation Action Program Exercise

Tuscaloosa County Hazard Mitigation Planning Committee

Name of Community (town, city, or county), School Board, or Agency:

____

Prepared by:____

(name and position)

<u>Instructions for selecting mitigation measures.</u>

1. For Communities, which include all municipalities and the county government, place an X in the column under the Communities column for all those measures your jurisdiction would like to include in your five-year Community Action Program. Mark through those you want to exclude.
2. For School Boards, place the name of the community next to the mitigation measures to be undertaken within the selected community. Only address those measures that will be undertaken by your school board.
3. For Agencies (State, local, non-profit, etc.), place the name of the community next to the mitigation measure recommended for the selected community. These measures are not necessarily the responsibility of your agency.

If you have additional measures to include, please write them down on the back of this page.

Please keep in mind your capabilities to carry out the measure.

Some of the measures might be carried out jointly through the Tuscaloosa County EMA (e.g., outreach activities), Tuscaloosa County (e.g., shared GIS resources), or other agencies.

You do not need to identify the funding source at this time.

2014-2019 Tuscaloosa County Multi-Jurisdictional Mitigation Action Program

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
1	**Goal for Prevention.** **Manage the development of land and buildings to minimize risks of loss due to natural 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 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.		All	Both	Action	
1.1.2	Integrate the findings and recommendations of this plan into comprehensive plan amendments for jurisdictions with active comprehensive planning programs.		All	Both	Action	
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.		All	Both	Action	
1.2	**Geographic Information Systems (GIS). Maintain a comprehensive database of hazards locations, socio economic data, infrastructure, and critical facilities inventories.**					
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, hurricane surge areas, tornado tracks, disaster events and their extents, and a comprehensive inventory of critical facilities within all jurisdictions.		All	Both	Action	

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
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.		All	Both	Action	
1.2.3	Mark depths of flooding and storm surge immediately after each event. Enter and maintain these historical records in GIS.		Flooding	Both	Action	
1.3	**<u>Planning Studies</u>. Conduct special studies, as needed, to identify hazard risks and mitigation measures.**					
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.		Flooding	Both	Action	
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.		All	Existing	Action	
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.		Flooding	Existing	Action	
1.3.4	Inventory and map existing fire hydrants throughout the county, and identify areas in need of new fire hydrants.		Wildfires	Existing	Action	
1.3.5	Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.		Flooding	Both	Action	
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.		Earthquake	Existin g	Projec t	
1.4	**<u>Zoning</u>. Establish effective zoning controls, where applicable, to vulnerable land areas to discourage environmentally incompatible land use and development.**					

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
1.4.1	Consider large lot size restrictions on flood prone areas designated on Flood Insurance Rate Maps.		Flooding	Both	Action	
1.4.2	Evaluate additional land use restrictions within designated flood zones, such as prohibition of storage of buoyant materials, storage of hazardous materials, restrictive development of flood ways, among others.		Flooding	Both	Action	
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.		Flooding	Both	Action	
1.4.4	Enact local ordinance that require community storm shelters within sizeable mobile home parks and subdivisions.		Tornadoes, Hurricanes, Severe Storms	New	Action	
1.5	**<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 parks, conservation areas, landscaping, and drainage.**					
1.5.1	Examine regulatory options and feasibility of requiring open space areas for recreation, landscaping, and drainage control.		Flooding	New	Action	
1.6	**<u>Flood Plain Management Regulations.</u> Effectively administer and enforce local floodplain management regulations.**					
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.		Flooding	Both	Action	
1.6.2	Maintain a library of technical assistance and guidance materials to support the local floodplain manager.		Flooding	Both	Action	
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.		Flooding	Both	Action	

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
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.		Flooding	Both	Action	
1.6.5	Participate in the "Turn Around Don't Drown" program by purchasing and installing signs in known flash flood bridge overpass locations.		Flooding	Existing	Project	
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.		Flooding	Both	Projec t	
1.7	**<u>Building and Technical Codes.</u> Review local codes for effectiveness of standards to protect buildings and infrastructure from natural hazard damages.**					
1.7.1	Promote good construction practices and proper code enforcement to mitigate structural failures during natural hazard events.		All	New	Action	
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."		Tornadoes, Hurricanes, Severe Storms	New	Action	
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.		Tornadoes, severe storms, winter storms/freezes , hurricanes	Both	Action	
1.7.4	Ensure fire safety ordinances properly regulate open burning, the use of liquid fuel and electric space heaters.		Wildfires	Both	Action	
1.7.5	Establish and enforce minimum property maintenance standards that reduce or eliminate unsafe structures.		All	Existing	Action	
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.		Tornadoes, Hurricanes, Severe Storms	New	Project	

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
1.8	**<u>Landscape Ordinances.</u> Establish minimum standards for planting areas for trees and vegetation to reduce storm water runoff and improve urban aesthetics.**					
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.		Flooding	New	Action	
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.		Wildfires	Both	Action	
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.		Wildfires	Both	Action	
1.9	**<u>Storm Water Management.</u> Manage the impacts of land development on storm water runoff rates and to natural drainage systems.**					
1.9.1	Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.		Flooding	Existing	Action	
1.9.2	Develop, adopt and implement subdivision regulations that require proper stormwater infrastructure design and construction.		Flooding	Existing	Action	
1.9.3	Establish urban forestry program to help mitigate storm water runoff common in areas with large impervious surfaces.		Flooding	Both	Action	
1.10	**<u>Dam Safety Management.</u> Establish a comprehensive dam safety program.**					
1.10.1	Support legislation to establish a State dam safety program.		Dam/Levee Failure	Both	Action	
1.11	**<u>Community Rating System Program (CRS).</u> Increase participation of NFIP member communities in the CRS Program.**					

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
1.11.1	Apply for/maintain membership in the CRS Program; continue to upgrade rating.		Flooding	Both	Action	
1.12	**<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 disaster events.**					
1.12.1	Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from hazards.		Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Existing	Action	
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.		Wildfire	Both	Project	
2	**<u>Goal for Property Protection:</u> Protect structures and their occupants and contents from the damaging effects of natural hazards.**					
2.1	**<u>Building Relocation.</u> 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	Existing	Project	
2.2	**<u>Acquisition.</u> Acquire flood prone buildings and properties and establish permanent open space.**					
2.2.1	Acquire and demolish flood prone or substantially damaged structures and replace with permanent open space.		Flooding	Existing	Project	
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.		Flooding	Existing	Project	

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
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; where feasible, elevation is preferable to flood proofing.		Flooding	Existing	Project	
2.3.2	Repair, elevate and weatherize existing homes for low- to moderate-income families.		Flooding	Existing	Project	
2.4	**Flood Proofing. Encourage flood proofing of buildings in hazardous flood areas to safeguard against damages.**					
2.4.1	Flood proof pre-FIRM non-residential buildings, where feasible.		Flooding	Existing	Project	
2.4.2	Examine use of minor structural projects (small berm or floodwalls) in areas that cannot be mitigated through non-structural mitigation techniques.		Flooding	Both	Project	
2.5	**Building Retrofits. Retrofit vulnerable buildings to protect against natural hazards damages, including flooding, high winds, tornadoes, hurricanes, severe storms, and earthquakes.**					
2.5.1	Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.		Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Existing	Action	
2.5.2	Provide technical advisory assistance to building owners on available building retrofits to protect against natural hazards damages.		Flooding, Tornadoes, Hurricanes, Severe Storms and Earthquakes	Existing	Action	
2.6	**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.**					

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
2.6.1	Promote the purchase of insurance coverage by property owners and renters for flood damages in high-risk areas.		All	Existing	Action	
2.6.2	Promote the purchase of crop insurance to cover potential losses due to drought.		Drought	Existing	Action	
2.7	**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 or construction of new facilities for maximum protection from all hazards.**					
2.7.1	Install lightning and/or surge protection on existing critical facilities.		Severe storms	Existing	Project	
2.7.2	Conduct ongoing tree trimming programs along power lines.		Severe storms	Existing	Action	
2.8	**Back Up Power: Assure uninterrupted power supplies during emergency events.**					
2.8.1	Install backup power generators for critical facilities.		Hurricanes, Tornadoes, Severe Storms	Existing	Project	
3	**Goal for Public Education and Outreach. Educate and inform the public about the risks of hazards and the techniques available to reduce threats to life and property.**					
3.1	**Map Information. Increase public access to Flood Insurance Rate Map (FIRM) information.**					
3.1.1	Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications and newspaper announcements.		All	Both	Action	
3.2	**Outreach Projects. Conduct regular public events to inform the public of hazards and mitigation measures.**					
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.		All	Both	Action	

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
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.		All	Existing	Action	
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.		All	Both	Action	
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.		Flooding	Both	Action	
3.2.5	Educate citizens on water saving techniques.		Drought	Both	Action	
3.2.6	Educate farmers on soil and water conservation practices.		Drought	Both	Action	
3.3	**Real Estate Disclosure. Encourage real estate agents to disclose flood plain location for property listings.**					
3.3.1	Arrange with the Multiple Listing Service (MLS) to require floodplain location disclosure as a condition for each real estate listing.		Flooding	Existing	Action	
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.		Flooding	Existing	Action	
3.4	**Library. Use local library resources to educate the public on hazard risks and mitigation alternatives.**					
3.4.1	Through local libraries, maintain and distribute free and current publications from FEMA, NWS, USGS, and other federal and state agencies.		All	Both	Action	
3.5	**Education Programs. Use schools and other community education resources to conduct programs on topics related to hazard risks and mitigation measures.**					
3.5.1	Distribute hazard mitigation brochures to students through area schools.		All	Both	Action	

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
3.5.2	Educate homeowners about structural and non-structural retrofitting of vulnerable homes.		Earthquake	Both	Action	
3.6	**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.**					
3.6.1	Distribute the 2014 plan to local officials, stakeholders, and interested individuals through internet download.		All	Both	Action	
3.7	**Technical Assistance. Make qualified local government staff available to advise property owners on various hazard risks and mitigation alternatives.**					
3.7.1	Provide technical assistance to homeowners, builders, and developers on flood protection alternatives.		Flooding	Both	Action	
3.8	**Mass Media Relations. Utilize all available mass media, such as, newspapers, radio, TV, cable access, internet blogs, podcasts, video sharing, and on-line social networking to increase public awareness and distribute public information on hazard mitigation topics.**					
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.		All	Both	Action	
3.9	**Weather Radios. Improve public access to weather alerts.**					
3.9.1	Promote the use of weather radios in households and businesses.		All	Both	Action	
3.9.2	Require the installation of weather radios in all public buildings and places of public assembly.		All	Both	Action	
3.9.3	Distribute weather radios and emergency response instructions to municipal residents.		All	Both	Action	
3.10	**Disaster Warning. Improve public warning systems.**					

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
3.10.1	Upgrade siren-warning systems to provide complete coverage to all jurisdictions.		Flooding	Both	Project	
3.10.2	Upgrade critical communications infrastructure.		Flooding	Both	Project	
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, flood plains, 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 flood plain acquisition efforts.		Flooding	Existing	Project	
4.2	**River/Stream Corridor Restoration and Protection. Restore and protect river and stream corridors within areas.**					
4.2.1	Keep builders and developers informed of Federal wetlands permitting requirements of the Corps of Engineers.		Flooding	Both	Action	
4.2.2	Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.		Flooding	Existing	Action	
4.3	**Urban Forestry Programs. Maintain a healthy forest that can help mitigate the damaging impacts of flooding, erosion, landslides, and wild fires within urban areas.**					
4.3.1	Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).		Flooding	Existing	Action	
4.3.2	Increase overall green spaces in cities by planting hurricane resistant trees with site and location taken into consideration.		Wildfire	Both	Action	

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
4.3.3	Develop an urban forestry management plan to ensure a progressive urban forestry program aimed at increasing forestry canopy, increased safety and planting hurricane resistant tree species.		Wildfire	Both	Action	
4.5	**<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.**					
4.5.1	Enforce water use restrictions during periods of drought to conserve existing water supplies.		Droughts/heat waves, wildfires	Both	Action	
5	**<u>Goal for Structural 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 Maintenance.</u> Improve maintenance programs for streams and drainage ways.**					
5.1.1	Prepare and implement standard operating procedures and guidelines for drainage system maintenance.		Flooding	Both	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 in identified problem drainage areas.		Flooding	Both	Project	
5.2.2	Improve and retrofit water supply systems to save water during drought events and to eliminate breaks and leaks.		Drought	Both	Project	
5.3	**<u>Community Shelters and Safe Rooms</u>: Provide shelters from natural hazards for the safety of community residents.**					

Goal, Objectives and Mitigation Measures		Communities	Hazards Addressed	Affects New or Existing Buildings or Infrastructure	Action or Project	Funding Source
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.		Hurricanes, Tornadoes, Severe Storms	New	Project	
5.3.2	Establish a program for subsidizing individual and community safe room construction in appropriate locations and facilities.		Hurricanes, Tornadoes, Severe Storms	Both	Project	
5.3.3	Encourage the construction of safe rooms in new and existing homes and buildings.		Hurricanes, Tornadoes, Severe Storms	Both	Project	

Appendix J
Adopting Resolution

App. J – Adopting Resolution

1.0 Purpose

The sample resolution presented here serves as a model for the governing bodies of the participating jurisdictions to adopt the 2014 plan update following a public hearing. Each jurisdiction may modify the sample to fit their particular legal form.

2.0 Sample Adopting Resolution

RESOLUTION OF THE (GOVERNING BODY)

A RESOLUTION ADOPTING THE 2014 TUSCALOOSA 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 Tuscaloosa County jurisdiction to continue to qualify for FEMA mitigation grant assistance programs, the DMA 2000 requires the five year update of the Tuscaloosa County Hazard Mitigation Plan 2009 Plan Update, which was approved by FEMA on October 7, 2009; and,

WHEREAS, the AEMA had awarded a $20,625.00 planning grant funded through the FEMA Hazard Mitigation Grant Program (HMGP) to the Tuscaloosa County Commission to fund a portion of the $29,000 total cost of the five year plan update for all jurisdictions within Tuscaloosa County; and,

WHEREAS, the 2014 Tuscaloosa County Multi-Hazard Mitigation Plan has been prepared in accordance with DMA 2000 requirements under the direction of the Tuscaloosa County Hazard Mitigation Planning Committee with the support of the Tuscaloosa County EMA, on behalf of all of the jurisdictions within Tuscaloosa County; and,

WHEREAS, said mitigation plan addresses all natural and man-made hazards deemed to threaten property and persons within the unincorporated and incorporated areas of Tuscaloosa 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 2014 Tuscaloosa County Multi-Hazard Mitigation Plan is hereby adopted and immediately made effective.

ADOPTED this the ____________ day of ________________________________, 2014.

APPROVED: ____________________________________

ITS: _____________________________________

ATTEST: ____________________________________

ITS: _____________________________________