

LAURENS COUNTY, SOUTH CAROLINA HAZARD MITIGATION PLAN

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I. Introduction

The Laurens County Hazard Mitigation Plan was developed in accordance with the requirements of the Federal Emergency Management Agency (FEMA) Section 322 local hazard mitigation planning regulations as well as additional guidance documents provided by FEMA and the South Carolina Office of Emergency Management. The goal of this plan is to assist Laurens County in reducing the human and economic costs of natural disasters. This plan provides a comprehensive risk assessment, vulnerability analysis, mitigation strategies, and implementation schedule for the county and each of the municipalities. At the request of the Laurens County Emergency Management Office and the Laurens County Council, this plan analyzes both natural and man-made hazards including acts of terrorism.

A. DESCRIPTION OF PLANNING AREA

Laurens County is located in the center of the Upstate of South Carolina. The county is bordered on the north by Greenville County and Spartanburg County, on the east by Newberry County and Union County, and to the south by Greenwood County and Abbeville County. The total land area in Laurens County is approximately 713 square miles. Laurens is located approximately 35 miles from Greenville, SC and 71 miles from Columbia, SC. The population of Laurens County based on the 2010 Census was 66,537, showing a slight decrease over the last decade.

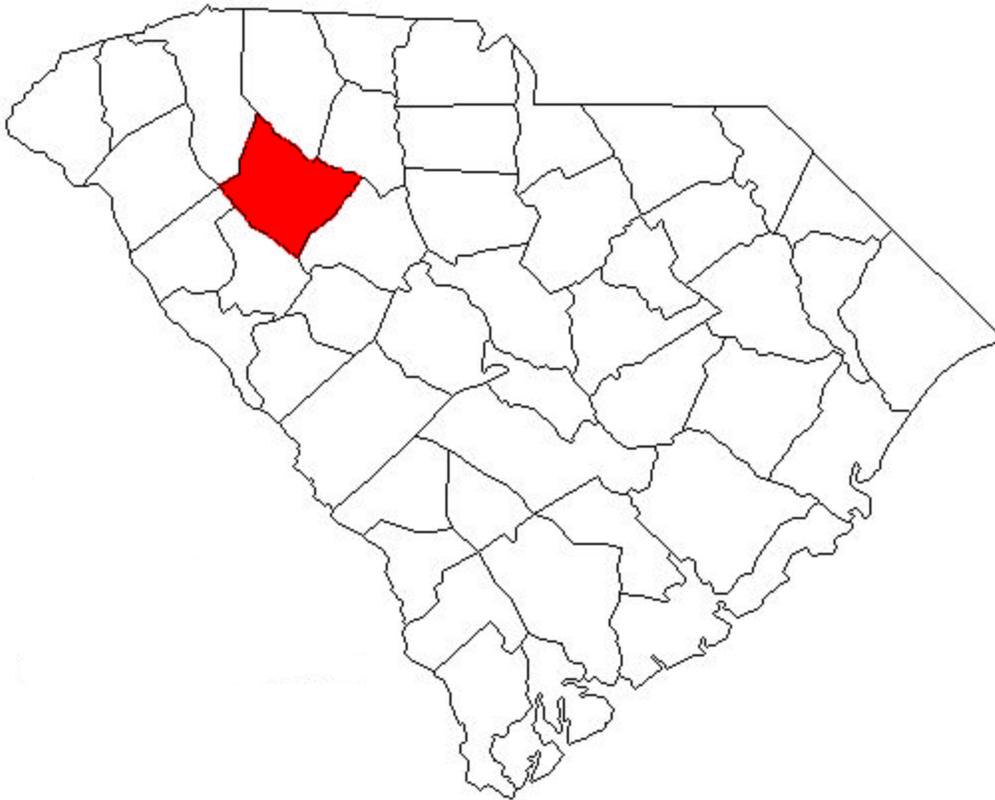
The County contains five incorporated municipalities: **Laurens (county seat), Clinton, Gray Court, Cross Hill, and Waterloo**, all of which are small towns in rural settings. Laurens County also contains the following unincorporated communities: Youngs, Enoree, Hickory Tavern, Ekom, Greenpond, Lanford, Barksdale, Owings, Joanna, Princeton, Brewerton, Cold Point, and Mountville. A small portion of the incorporated towns of Fountain Inn and Ware Shoals also lie within Laurens County.

Laurens County has a continental-type climate, predominantly influenced by air from the west, which has traveled across the central United States. Winters are generally short, with very few days of intense cold. The mean temperature for January is 45 degrees Fahrenheit. Summers are warm, with high humidity and afternoon thunderstorms. The mean temperature during July is 81°F. Precipitation tends to be evenly distributed throughout the year, with an annual average of approximately 48 inches, almost all of that exclusively as rain.

There are an estimated 40,000 structures in the county. Approximately 95% of these buildings are considered residential uses. The County has other amenities including a Courthouse, Judicial center, schools, fire departments, an Emergency Communications Center, a Detention Center and a Sheriff's Law Enforcement Center. There are also facilities that store hazardous materials and small dams located in Laurens County.

- **Laurens** is located near the center of Laurens County and is the county seat. It is surrounded by unincorporated and largely undeveloped areas. Laurens is approximately 10 square miles and has a population of 9,139 making it the largest municipality in the county. Gentle slopes characterize the topography of Laurens. The largest portion of the City is made up of single-family residential areas.
- **Clinton** is situated approximately seven miles west of Laurens. According to the 2010 Census the population of Clinton is 8,490. The city is approximately nine square miles in area and is surrounded by agricultural or undeveloped land.
- **Gray Court** is located north of Laurens. It is approximately 1 square mile in area and has a population of 787. Gray Court is a residential community surrounded by farmlands.

- **Cross Hill** is situated approximately ten miles south of Laurens. According to the 2010 Census the population of Cross Hill is 494. The town is approximately one square mile in area and is surrounded by agricultural or undeveloped land.
- **Waterloo** is located approximately 8 miles south of Laurens. It is less than 1 square mile in area and has a population of 160, making it the smallest municipality in the County. Waterloo is a residential community surrounded by farmlands.



Laurens County (red) within South Carolina



Laurens County Communities

II. Planning Process

The planning process utilized in Laurens County was based on the Section 322 local planning requirements of the Disaster Mitigation Act of 2000 and supporting guidance documents developed by FEMA and the South Carolina Emergency Management Division. The planning process included the following steps, which will be described in greater detail throughout the plan:

- Step 1: Establish a Hazard Mitigation Planning Committee
- Step 2: Conduct the Risk Assessment
- Step 3: Develop Capabilities Assessment
- Step 4: Create Mitigation Plan
- Step 5: Adopt and Implement Plan

This process was led by the Laurens County Hazard Mitigation Planning Committee members and supported by Upper Savannah Council of Governments staff.

The activities undertaken by Laurens County are all overseen by the steering committee, which is made up of county, municipal, regional, and private entity representatives as described in the table below.

Table 1. Laurens County Hazard Mitigation Committee Membership

Name	Organization
Joey Avery	Laurens County EMA Director
Tavi Hughes	Laurens County E911 Administrative Assistant
Angela Sipes	Laurens Commission of Public Works GIS Coordinator
Ernie Segars	Laurens County Administrator
Chrissie Cofield	City of Laurens PD Assistant Chief
Rick Green	Upper Savannah COG Government Services Director
Chad Burrell	Laurens County EMS Director
Greg Lindley	Laurens County Fire Services Director
Robin Morse	Clinton City Public Safety Chief
Sonny Ledda	City of Laurens PD Chief
Bill Hughes	Laurens City Fire Chief
Rodney Smith	Laurens County School District 55, Chief Operations Officer

The public will be asked to comment on mitigation needs of the community through meetings at various times throughout the planning process. Any relevant public comments will be included in the final document.

RISK ASSESSMENT AND MITIGATION PLANNING

One of the early acts of Laurens County was to create a Risk Assessment and Mitigation Plan to examine the community's risks and vulnerabilities to natural and man-made hazards. This plan, begun in January 2015, comprised data from federal, county, municipal, and private sources.

The committee reviewed the following existing plans and technical information before and during the update process: Laurens County Hazard Mitigation Plan, Laurens County Comprehensive Plan, municipal Comprehensive Plans, municipal Zoning Ordinances, municipal and county Flood Plain Ordinances, weather reports from the National Oceanographic and Atmospheric Administration and various instructional materials from the Federal Emergency Management Agency. Relevant information from these documents was placed at the pertinent location in this updated plan.

The committee decided that they would take the entire existing plan and review it to start the update process. Members were provided copies of the plan for review and comment. Through individual discussions with the committee members, it was determined that the planning team needed to be expanded. An effort was made to gain participation from the cities of Laurens and Clinton as well as the school district and higher education. Once these members were added to the planning committee, they were able to add impacts on their individual work areas to the benefit of the plan as a whole. This was the only change the committee decided to make to the planning process section of the plan.

Risk Assessment and Mitigation Planning Committee Membership

The Hazard Mitigation Planning Committee was tasked with most of the activities related to the development of this plan and was considered the Core Planning Team. Committee members have worked throughout the process from the initial meeting to the development of the plan.

COUNTY AND MUNICIPALITY PARTICIPATION

County, city, and town participation must be defined in order to create a standard for participation and representation in order for the entities to be considered as participants in the Natural Hazard Mitigation Plan process.

In order for counties to approve the plan and be an official participant of this planning process, they must satisfy the following consideration:

- The county Emergency Management Director is a member of the Hazard Mitigation Planning Committee and provides input and commentary on the planning process.

In order for cities and towns to be official participants of the planning process, they must satisfy one of the following considerations:

- The mayor, administrator, or manager attended a county or public meeting concerning the Natural Hazard Mitigation Plan and provided input and commentary on the planning process.

- The mayor, administrator, or manager appointed a city or town employee to attend a county or public meeting concerning the Natural Hazard Mitigation Plan and that person provided input and commentary on the planning process.
- The plan coordinator personally discussed the Natural Hazard Mitigation Plan with a mayor, administrator, manager, or appointed municipal representative. The plan coordinator provided the local government representatives the opportunity to review and to comment on the entire plan.

LAURENS COUNTY LOCAL GOVERNMENT PARTICIPATION

Laurens County

City of Laurens

City of Clinton

Not participating: Towns of Cross Hill, Gray Court, and Waterloo – These towns rely on the County for hazard mitigation activities.

PUBLIC INVOLVEMENT

Throughout the process there were opportunities for public input. A public meeting was held on March 25, 2015 to kick off the planning process and to describe the overall planning process. Invitation letters to the first public meeting were mailed to all local governments within or near Laurens County, school districts, utility providers, and the Chamber of Commerce. Opportunities for comment were also given to the larger non-profits such as the American Red Cross and United Way, and to institutes of higher learning such as Piedmont Technical College and Presbyterian College.

A follow-up public meeting was held on August 20, 2015 to review plan updates.

In addition, the final draft of the plan was placed at Laurens County Emergency Management for public comment and review. An email address and the telephone number was provided with the draft plan to provide a mechanism for the public to provide comments back to plan development facilitators. In addition, all meetings the Hazard Mitigation Planning Committee were open to the public.

All comments that have been received to date from the public were reviewed and incorporated into the final version of the plan as appropriate.

In addition the public will be invited to the plan adoption hearing of the Laurens County Council. A public notice of the adoption hearing will be posted.

After the plan is approved, public involvement will continue through regular presentations by the Emergency Management Director and staff. Due to limited staff and fiscal constraints, the public involvement and plan review has not been kept up with on a regular basis for the recent past. Staff will now include hazard mitigation discussions in regularly held plan review meetings at least once per year.

Public meeting minutes and an attendance list are included in the Appendix of this plan.

Activity Timetable

Laurens County staff and COG staff meet to discuss process	January 2015
Meeting notices distributed	March 2015
Kick off meeting for plan update	March 25, 2015
Plan Update Process	March/April
Submittal of plan for initial review by SCEMD	April 24, 2015
Revision and resubmittal of plan to SCEMD	August 2015

IV. Risk Assessment

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural or man-made hazards. The results of this risk assessment assist Laurens County and its incorporated municipalities in identifying and understanding their risks from natural and man-made hazards. This information also serves as the foundation for the development of the mitigation plan and strategies to help reduce risks from future hazard events.

The Hazard Mitigation Planning Committee reviewed the following existing plans and technical information before and during the update process: Laurens County Hazard Mitigation Plan, Laurens County Comprehensive Plan, County Flood Plain Ordinance, weather reports from the National Oceanographic and Atmospheric Administration and various instructional materials from the Federal Emergency Management Agency.

Relevant information from these documents was placed at the pertinent location in this updated plan.

The committee decided that they would take the entire existing plan and review it to start the update process. Committee members were provided copies of the draft plan for review and comment. After the initial meeting and in subsequent phone calls, the committee decided to not make any changes to the risk assessment portion of the plan. The committee felt confident in the process outlined in training sessions provided by the South Carolina Emergency Management Division. The risk assessment portion of the plan was also left unchanged to measure the continuity from how past risk was measured and to monitor trends or point to significant changes.

This risk assessment followed the methodology described in the FEMA publication 386-2 “Understanding Your Risks – Identifying Hazards and Estimating Losses” and was based on a four-step process: 1) Identify Hazards, 2) Profile Hazard Events, 3) Inventory Assets, and 4) Estimate Losses. Using FEMA guidance, as well as the Section 322 regulations for developing local hazard mitigation plans EK has developed a risk assessment that identifies:

- The hazards to which the county and its communities are susceptible.
- The impact of these hazards on physical, social, and economic assets.
- The areas within the county most vulnerable to these hazards.
- The potential costs of damages or costs avoided through future mitigation projects.

A. Hazard Identification

The first step in the risk assessment process was to identify each of the hazards that can occur within Laurens County and its incorporated municipalities. This hazard identification process began with a review of previous hazard events based on historical data provided by the Laurens County Emergency Management Director and the Laurens County Hazard Mitigation Plan coordinator. They also conducted a review of existing resources, plans, and reports provided by FEMA, Laurens County, and other sources to understand the nature and extent of natural and man-made hazards in the county. In addition to these resources they also conducted hazard identification and prioritization exercises with the members of the Core Planning Team. The findings from these steps were utilized to determine the priority hazards for Laurens County and its municipalities, which will become the focus of the mitigation strategies developed in the remainder of this plan.

1. Hazard History

Past occurrences of hazard events are likely predictors of future events. A review of the hazard history of Laurens County, therefore, helps to provide a better understanding of what hazards the county is susceptible to. Detailed descriptions of the historic hazard events, including information on losses of life and property, as well as estimated damages are included in the Appendix. Below are summaries of the major events by hazard type based on information that was available during the development of this plan.

Flood

South Carolina has two high-water periods each year, one in December-April caused by winter rains and spring showers, another in the fall when tropical storms may bring additional rain. Hurricanes have often brought flash flooding and river flooding.

Laurens County has some streams that are subject to flooding during heavy rainfall periods. The majority of these streams have sufficient depth to their banks to prevent flooding that will endanger human lives or real property. The Saluda River, which marks the western boundary of Laurens County has no significant history of flooding due to its impoundment at Lake Greenwood. Little River experienced major flooding in the 1970's, but this problem area has been addressed through extensive storm water management. While flooding is experienced on many of the streams around the County during heavy rains, there are no recorded cases in recent history of deaths or injuries. There are no repetitive loss structures in the County so the percentage of damages would be less than 5% of the total natural hazard loss for the County.

RECENT FLOODING EVENTS

April 9, 1998: Flash flooding occurred across Laurens County. Bridges were covered by water as creeks and rivers rose out of their banks. No injuries or damage reported.

September 22, 2000: Heavy rain caused flooding in low-lying areas across the county. No injuries or damage reported.

February 27, 2003: The Little River flooded near the city of Laurens. Several roads and intersections were closed in Laurens. No damage or injuries reported.

July 29, 2004: Flooding occurred in northern Laurens County. No damage or injuries reported.

September 27, 2004: Flash flooding occurred across Laurens County, where up to 1.5 feet of water accumulated in low places on Interstate 385 from Laurens to the Greenville line.

Flooding was also reported along highway 221S around Waterloo with 1 foot of water covering the road. Property damage was reported to be \$5,000.

October 7, 2005: Heavy rain caused creeks to flood Pine Haven St. in Waterloo and Hillcrest St. in the western part of Laurens County. No damage or injuries reported.

Winter Storm

There were major Southeastern snow storms in 1899, 1914, 1973, 2000, and 2002. Additionally, there have been many more localized winter storms. In January 1968 and February 1979 large ice storms paralyzed the County for several days. More recently in 2011 and in 2014 ice and snow storms covered the County resulting in power outages and hazardous driving conditions. Laurens County suffers an average of one to two winter storms each year. The percentage of damages due to winter storms to vulnerable structures would be low (less than 5% of the total natural hazard loss for the County).

Recent Winter Storm Events

January 2, 1999: A winter ice storm resulted in road and business closures. School and government facilities were also forced to close. There were no reported injuries and no damage to public facilities. Snow was reported in the county in February 1999.

January 24, 2000: Heavy snowfall was reported over most of the state. Laurens County was part of the Federal Disaster declaration. School and government facilities were also forced to close. There were no reported injuries and no damage to public facilities.

December 4-5, 2002: Ice accumulations of 0.5 to 1.5 inches of ice were observed, causing widespread damage. The winter storm resulted in road and business closures across Laurens County. School and government facilities were forced to close. There were no reported injuries, but over \$100 million in damage and hundreds of thousands of power outages were reported across the Upstate of South Carolina.

January 29-30, 2010: A mix of snow, sleet, and freezing rain fell across Laurens County. Total sleet and snowfall accumulations ranged from trace amounts to around 0.5 inches. Light ice accumulation also occurred on elevated surfaces.

February 12, 2010: As much as 5 inches of snow accumulation resulted in road, business, school, and government closures. There were no reported injuries and no damage to public facilities.

March 2, 2010: A mix of snow and rain fell across the area. Accumulations were light, ranging from a trace to 0.5 inches across the Upstate of South Carolina. There were no reported injuries and no damage to public facilities.

January 10, 2011: Snow accumulations between 6-8 inches across the region closed schools and businesses for as much as 5 days. There was also a brief period of light, freezing rain which resulted in up to .10 inches of ice accumulation. There were no reported injuries and no damage to public facilities.

January 25, 2013: Light sleet and freezing rain fell across Laurens County. Only trace accumulations were reported. There were no reported injuries and no damage to public facilities.

February 11-12, 2014: Widespread snow, sleet, and freezing rain fell across Laurens County. Most areas saw 3-6 inches of snow and sleet across the Upstate of South Carolina. There were no reported injuries and no damage to public facilities.

November 1, 2014: Moderate to heavy snow fell across Laurens County. With warm ground temperatures, accumulations were confined to grassy areas and elevated surfaces. There were no reported injuries and no damage to public facilities.

Tornado

Laurens County has experienced fifteen recorded incidences of tornado touchdowns and several funnel clouds since 1950. The most recent tornado occurred in 2011 and no death or injury was reported.

March 3, 1960: An F2 tornado caused approximately \$25,000 in property damage.

December 13, 1973: An F3 tornado injured 1, and caused approximately \$2,500,000 in property damage.

May 8, 1977: An F1 tornado injured 5, and caused approximately \$250,000 in property damage.

March 28, 1984: An F2 tornado injured 43, and caused approximately \$250,000 in property damage.

May 4, 1990: An F0 tornado hit near the City of Laurens. No injuries were reported, and over \$3,000 in property damage was recorded.

May 25, 1993: An F0 tornado touched down near Greenpond. No injuries were reported, but nearly \$500,000 in property damage occurred as a result of this tornado.

April 19, 1998: An F0 tornado touched down near Waterloo. No injuries were reported, and approximately \$70,000 in property damage was recorded.

July 2, 2003: An F0 tornado touched down near Waterloo. No injuries were reported, and approximately \$1,000 in property damage was recorded.

September 16, 2004: An F0 tornado touched down south of the City of Laurens. No injuries or property damage were reported.

January 13, 2005: An F2 tornado struck near the City of Laurens, causing damage to homes and schools. The tornado also caused a major fire at a local industry causing approximately \$35,000,000 in damage.

January 17, 2006: An F0 tornado hit near the City of Laurens causing \$1,000 in damage, but no injuries.

September 14, 2007: An EF1 tornado touched down near Hickory Tavern. No injuries were reported, and approximately \$10,000 in damage was recorded.

May 4, 2009: An EF0 tornado touched down near Cross Hill. No injuries were reported, and approximately \$20,000 in damage was recorded.

November 30, 2010: An EF1 tornado touched down near Owings and was on the ground for nearly 2 miles. The tornado uprooted trees, and caused damage to buildings. No injuries were reported, and approximately \$50,000 in damage was recorded.

March 19, 2011: An EF0 tornado touched down near Cross Hill and was on the ground for 0.2 miles. Damage was limited to several trees and minor building damage. There was siding and window damage to a couple of houses in the area. No injuries were reported, and property damage is unknown.

Manufactured housing is particularly vulnerable to high winds, whether from a tornado, thunderstorm, or tropical storm. There were over 9,998 manufactured homes in Laurens County in 2010. The City of Laurens had 300, and Clinton had 430 manufactured homes. Because of the random nature of tornadoes and the large number of vulnerable structures such as manufactured housing, the potential percentage of damage would be very high (50% +). (Manufactured housing numbers source: Census 2010)

Structural Fires

Considering that each fire has the capacity to spread rapidly, and that the fire might encompass hazardous materials and highly flammable and explosive materials necessitating the evacuation of a large number of people, the fire rating is moderate. The percentage of structure fires for vulnerable structures would be low (less than 10%).

Wildfire

Forest fires are a serious problem in Laurens County. Records indicate that humans cause a majority of these fires. Approximately 30 fires occur each year, burning over 100 acres. Other causes of fire include lightning, campfires, smoking, debris burning, incendiary equipment use, and railroads. In addition to the South Carolina Forestry Commission personnel, members of the Laurens County rural fire departments assisted in extinguishing the fires which occurred. These types of fires are usually not large enough to damage vulnerable structures, but the risk here remains low (less than 10%).

Severe Thunderstorm

Laurens County has numerous severe thunderstorms each year. These storms sometimes produce high winds, hail, lightning, and flash flooding. These factors can be made worse by the occasional tornado accompanying these events. The most recently recorded severe thunderstorm events occurred in July 2014 with no damage or injury resulting. Because of the propensity for thunderstorms, the percentage of vulnerable structures that could be damaged by a severe thunderstorm would be moderate (25% to 35%). Since the last plan update (2010-2014), there have been 38 reports of thunderstorm wind damage in Laurens County. The highest estimated wind gust was 70 mph on July 9, 2014 near Harris Springs. A large section of roof was removed from a restaurant in the area. There were no reported injuries, and approximately \$10,000 in damage was recorded.

Drought

A severe drought has occurred in Laurens County over the past several years. Other droughts happened during 1931-35, 1954-57, 1977-81, the late 1990's, and from 2005 - 2011. Crop and Livestock Feed Assessment Reports confirm the droughts of the summer have devastated crops and pastures in the County. Soybeans and other crops have burned up due to extreme heat and below normal rainfall. Pastures and hay crops were extremely short with poor prospects for fall. There are few, if any, cases of livestock deaths due to loss of feed because most livestock would be sold at a loss before death. Many wells run dry and cause major inconveniences to people and some businesses. Droughts do not affect vulnerable structures so their percentage of impact would be very low (less than 2%). The latest US Drought Monitor report for South Carolina is included as an attachment.

Earthquake

The only major recorded earthquake to be felt in Laurens County was the Charleston Earthquake of 1886, a magnitude 7.0 on the Richter Scale. Laurens County is in the medium risk earthquake zone, meaning that it is an area where moderate damage may be expected. The risk for vulnerable structures is very low (less than 5%) due to the limited size and number of earthquakes.

Hail

Hail can occur across the region at various times of the year. Property damage can happen, as well as damage to crops. Since 2005, there have been 51 hail events in Laurens County. None of these caused injury or reported damage. Hail can cause limited amounts of damage to vulnerable structures, but overall the percentage of damage remains low (10%). From 2010-2014, there were 20 hail events in Laurens County. The largest hail reported during this time period was 1.75" (golf ball size); on March 19, 2011, June 5, 2011, and again on July 3, 2012. No damage or injuries were reported in any of the three events.

Windstorm

Windstorms not associated with hurricanes or thunderstorms are rare, but they have the potential to impact the region. There have been 2 non-thunderstorm related wind events since 2005, and none occurred between 2010 and 2014 in Laurens County. The highest wind gust during this time period was estimated to be 63 mph on December 9, 2009. As a result, trees were blown down across the county. No injuries or property damage were reported. Another wind gust to around 35 mph was reported on April 13, 2009. One tree fell on a home in the City of Laurens, causing approximately \$5,000 in damage.

Windstorms can cause isolated damage to vulnerable structures, but these storms are rare and would cause limited damage so the percentage of damage is low (10%).

Tropical System

Since 1950, four Tropical Depressions have passed within 25 miles of Laurens County.

Tropical Depression Abby, 6/8/1968, Wind 25-35 mph, no flooding or damage reported

Tropical Depression Babe, 9/8/1977, Wind 25-35 mph, no flooding or damage reported

Tropical Depression Danny, 7/24/1997, Wind 20-30 mph, flash flooding occurred as heavy rain associated with Danny fell across Laurens County. North Rabun Creek came out of its banks, covering bridges, and flooding some homes. No injuries were reported, and approximately \$150,000 in property damage was recorded.

Tropical Depression Jeanne, 9/28/2004, Wind 20-30 mph, flash flooding occurred across Laurens County as heavy rain associated with Jeanne moved through. 5 to 6 inches of rain fell in just a 3-hour period. Up to 1.5 feet of water covered portions of Interstate 385. Flooding was also reported along highway 221S around Waterloo with up to a foot of water covering the road in low-lying areas. Water covered a number of bridges, and several

homes were evacuated due to flooding around Fountain Inn. No injuries were reported, and approximately \$5,000 in property damage was recorded.

A tropical depression has sustained wind speeds of less than 38 mph, a tropical storm has sustained winds between 39 and 73 mph, and a hurricane has sustained winds of 74 mph or greater. These types of storms can cause a significant percentage of damage to vulnerable structures (20% or more) but these events are rare and are usually declining in strength by the time they reach Laurens County. An historical tropical system tracking map from NOAA is attached.

Technological Hazards

Technological and man-made threats represent a category of events that has expanded dramatically throughout the past decades with advancements in modern technology. Like natural threats, they can affect localized or widespread areas, are frequently unpredictable, can cause substantial loss of life and damage to property, and can pose a significant threat to the infrastructure of a given area. Technological and man-made threats include hazardous materials incidents at fixed facilities or in transit accidents, power failures, radiological incidents at fixed facilities or in transit accidents, other types of transit accidents, and structural fires.

The biggest threat to Laurens County comes in the form of a potential transit accident. Previous accidents involving a chemical truck and a school bus claimed two lives, while a train derailment near Lydia Mills in the 1970's involved formaldehyde. Depending on the location and type of technological hazard, the impact to vulnerable structures would be minimal and generally related to fire.

2. Priority Hazards

The historical hazard information provided insight into some of the high priority hazards that should be included in the plan; however, it did not capture all of the possible hazard risks in the county and municipalities. An additional review of possible hazard risks was conducted using the resources provided in “Understanding Your Risks – Identifying Hazards and Estimating Losses” (FEMA 386-2). The rationale for selecting these hazards is described in greater detail below.

Additional hazards were also identified and prioritized through an exercise that was conducted with the Core Planning Team. The participants were asked to identify natural and man-made hazards that occur in Laurens County and rank the selected hazards from highest to lowest priority. The results of those exercises are included in this document. The text below provides a summary of how the priority hazards were determined using a combination of historical occurrences, public perception of hazard risk, and the probability of future occurrence based on other technical resources.

PRIORITIZATION OF HAZARDS FOR LAURENS COUNTY

Based on these findings and the results of technical research the following hazards were selected as priority hazards for Laurens County: Severe Winter Storms; Drought; Severe Thunderstorms/ Lightning; Tornadoes; Wildfires; Earthquakes; Hail or Wind storms; Hazmat Incident/Transportation; Structure Fires; Hurricane/Tropical Storm; Flooding and Terrorism.

B. Profile of Hazard Events

The second step in the risk assessment process was to create a profile of each of the priority hazards in Laurens County. This analysis assisted in determining the potential damages in the county from natural and man-made hazards. This portion of the risk assessment was done through the use of Geographic Information Systems (GIS) software to develop maps that show the geographic locations for some of the priority hazards. Maps were developed for specific hazards using existing data and then created by the Laurens County Hazard Mitigation Plan coordinator. The remaining priority hazards are described in narrative form due to data limitations or an inability to map the geographic extent of the hazards.

1. Documented Hazards

Floods

Threat level: Moderate

Flooding is defined as a general and temporary condition of partial or complete inundation of normally dry land areas from: the overflow of inland or tidal waters; the unusual and rapid accumulation or runoff of surface waters from any source; or mudflows or the sudden collapse of shoreline land. Flooding is one of the moderate priority natural hazards in Laurens County. This is largely due to the physical geography of the county, which includes several rivers and creeks as well as a varied topography.

Identification of floodplain areas within the county and the incorporated municipalities was based on the most recent Flood Insurance Rate Maps (FIRM) produced by FEMA. These maps display the locations of all of the major water bodies in the county and delineate the 100-year floodplain boundaries (Zone A). These are areas that have a one percent chance of equaling or exceeding the recorded base flood elevation during any year. Based on these maps, Laurens County, (unincorporated areas only) and two out of the five incorporated municipalities have 100-year floodplains within their jurisdictions. Laurens and Clinton are the only municipalities with designated floodplains within their boundary. While the other municipalities may not have a mapped floodplain according to FEMA, they are not completely without flooding problems. According to the Laurens County Comprehensive Plan, nuisance flooding impacts many roads due to poorly designed and maintained drainage systems.

Rivers and creeks designated as flood prone areas include but are not limited to the following: Enoree River, Saluda River, Durbin Creek, Beaver Dam Creek, Warrior Creek, Duncan Creek, Bush River, Little River, Burnt Mill Creek, Reedy Fork Creek, Reedy River, and Rabon Creek. Potential flooding impact in or near the City of Laurens is from Little River and tributaries, Burnt Mill Creek, and Reedy Fork Creek. Potential flooding impact in or near the City of Clinton is from Bush River and Shell Creek.

A map of flood prone streams based on information provided by the USC Hazards Lab is included in the Appendix. In addition, FEMA Flood Insurance Rate Maps and Flood Hazard Boundary for Laurens County (unincorporated areas only) and the Cities of Clinton and Laurens are available online.

Laurens County Flood Hazard Areas

Jurisdiction	FEMA Mapped Special Flood Hazard Area	NFIP Participant	Flood Hazard Area Map Included in Plan
Laurens County (unincorporated areas only)	Yes	Yes	Yes
Laurens	Yes	Yes	Yes
Clinton	Yes	Yes	Yes

Based on continuing and on-going participation in the National Flood Insurance Program, all future development will conform to NFIP standards. These standards are also used to prioritize action steps of this plan. Since the last plan update in 2010, there have been no changes to the maps of flood-prone streams or rivers.

There are no repetitive loss structures in Laurens County or in any of the municipalities.

The Laurens County Building Codes Department has the responsibility for reviewing new development activities for compliance with the county's flood plain ordinances. The Codes Officer is the specific county employee responsible for these reviews.

Dam Failure

Dams are used for a variety of beneficial purposes including recreation, flood control, water storage, irrigation, mine tailings, electrical generation, debris control, and navigation. For as long as dams have been used, there has been a history of dam failures. As technology and engineering standards have improved, the safety of dams has also increased. However, all dams still face the possibility of failure.

Partial or complete failure of a dam happens when there is an uncontrolled release of the water held by the dam. This in turn can lead to the inundation of downstream areas which has the potential to cause loss of life or property. According to FEMA, dams can fail for numerous reasons; the main ones are:

- **Overtopping:** the amount of water above the dam exceeds the capacity of the reservoir and spills over the top of the dam
- **Sabotage:** the intentional act of damaging a dam in order to cause it to fail
- **Structural failure:** materials used in the construction of the dam fail due to design errors, workmanship errors, or material flaws
- **Movement and/or foundation failure:** the foundation of the dam is insufficient to resist the force of the water pressing against it; can also refer to geological instability due to changing water levels

- **Piping and/or internal erosion:** when soil particles within the dam move due to water seeping through the earthen dam, either weakening the dam or creating a passage for water to move freely through the dam wall
- **Inadequate maintenance and inspection:** regular inspection allows lesser failures or malfunctions to be discovered and corrected before leading to catastrophic failure (U.S. Department of Homeland Security *Why Dams Fail*)

Past dam failure events

There is no record of a significant dam failure occurring within Laurens County. According to the South Carolina 2008 Hazard Assessment, there have been 15 dam incidents in the state since 1975, with the most recent being 2007. The 15 incidents have caused five deaths and one injury.

Explanation of potential future dam events

Due to the fact that there have been no significant dam failures within Laurens County, no future probability can be calculated for this hazard type.

There are 37 regulated dams within Laurens County as well as numerous others which are not regulated. One is regulated by the Federal Energy Regulatory Commission and the others are regulated by the South Carolina Department of Health and Environmental Control. These dams range in classification from Low Hazard to High Hazard as defined below.

The Interagency Committee for Dam Safety created a hazard potential classification system to guide dam design criteria. While this classification system is based on probable loss of life and economic, environmental, and lifeline impacts, a dam classified as low hazard potential is not free from risks. Any dam that fails could be dangerous to life and property downstream.

As given by the Interagency Committee for Dam Safety's publication *Federal Guidelines to Dam Safety Hazard Potential Classification System for Dams*, the classifications are as follows:

1. LOW HAZARD POTENTIAL

Dams assigned the low hazard potential classification are those where failure or mis-operation [sic] results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

2. SIGNIFICANT HAZARD POTENTIAL

Dams assigned the significant hazard potential classification are those dams where failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominately rural or agricultural areas but could be located in areas with population and significant infrastructure.

3. HIGH HAZARD POTENTIAL

Dams assigned the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life (U.S. Department of Homeland Security Federal Guide).

*Earthquake**Threat level: Moderate*

An earthquake is a sudden motion or trembling that is caused by a release of strain accumulation within or along the edge of Earth's tectonic plates. The severity of these effects is dependent on the amount of energy released from the fault or epicenter. The effects of an earthquake can be felt far beyond the site of its occurrence. Earthquakes usually occur without warning and after just a few seconds can cause massive damage and extensive casualties. Common effects of earthquakes are ground motion and shaking, surface fault ruptures, and ground failure.

Peak ground acceleration (PGA) is a measure of the strength of ground movements. The PGA measures the rate in change of motion relative to the established rate of acceleration due to gravity. Based on the national map provided by the USGS shows the PGA values for areas with a 10% chance of being exceeded over 50 years the entire state of South Carolina has an earthquake risk as it is located in the .10 – .15%g area. According to FEMA, areas with a .3%g PGA or more are considered to have a moderate to high earthquake hazard risk and should consider earthquake hazards when developing hazard mitigation plans. In Laurens County, the earthquake risk is relatively low compared to other portions of the state or even the country. However, if there was even a moderate earthquake in the area, damage could be very high.

Proximity to faults, along with soil and subsurface characteristics, can all affect the level of earthquake hazard. It is important to note however the proximity of Laurens County to other areas of earthquake activity. The Central and Southeast U.S. region covers a large area of relatively diffuse, low rate seismicity. Principal areas of activity include the New Madrid Seismic Zone, East Tennessee, and Southern Appalachian Seismic Zones. These factors increase the likelihood of Laurens County experiencing or being affected by an earthquake at some point in time even though there is no historical evidence of earthquakes occurring in the past.

*Hazardous Materials Incident**Threat level: High*

The term technological hazard refers to the origins of incidents that can arise from human activities such as the manufacture, transportation, storage, and use of hazardous materials. For the purposes of this risk assessment it is assumed that technological emergencies are accidental and that their consequences are unintended.

Hazardous materials incidents typically take two forms, fixed facility incidents and transportation incidents. The major difference between the two is that it is reasonably possible to identify and prepare for a fixed site incident, because laws require those facilities to notify state and local authorities about what is being used or produced there. Transportation incidents are substantially harder to prepare for, however, because it is difficult to determine what material(s) could be involved until the accident actually happens.

In order to profile the technological hazards in Laurens County information was compiled on the locations of facilities that store hazardous materials. Based on records provided by the Laurens County Office of Emergency Management there are facilities in the county that store hazardous materials, some of which are facilities that store extremely hazardous substances (EHS). An attached map shows the locations of these facilities across the county.

*Terrorism**Threat level: Low*

The term terrorism refers to intentional criminal and malicious acts. For the purposes of this risk assessment terrorism refers to the use of Weapons of Mass Destruction (WMD), including, biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; and cyber terrorism.

*Severe Winter Storm**Threat level: High*

Winter storms vary in size and strength and can be accompanied by strong winds that create blizzard conditions and dangerous wind chill. There are three categories of winter storms. A blizzard is the most dangerous of all winter storms. It combines low temperatures, heavy snowfall, and winds of at least 35 miles per hour (mph), reducing visibility to only a few yards. A heavy snowstorm is one that drops 4 or more inches of snow in a 12-hour period. An ice storm occurs when moisture falls and freezes immediately upon impact. For the purposes of this risk assessment, it is assumed that all of Laurens County is equally at risk from severe winter storm events, but is at most risk of an ice storm.

*Severe Thunderstorms/Lightning**Threat level: Moderate*

A severe thunderstorm as defined by the National Weather Service is a storm with hail equal to or greater than 1" in diameter or convective wind gusts equal to or greater than 58 mph. Lightning and general thunderstorm wind gusts pose a threat to life and/or property. Severe thunderstorms also have the potential of producing a tornado with little or no advanced tornado warning. Based on historical evidence it is assumed that all of Laurens County is equally at risk from severe thunderstorm events.

*Windstorms**Threat level: Moderate*

For the purposes of this risk assessment windstorms are destructive wind events that occur with or without the presence of other storm events. Localized geographic conditions can exacerbate the damages from high winds and cause increases in wind intensity. Laurens County has experienced high wind damages in the past and can expect wind-related problems in the future. This assessment assumes that the risks from high wind events are equally distributed throughout the county.

*Tornadoes**Threat level: High*

A tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of 1 mile wide and 50 miles long. Tornadoes are among the most unpredictable of weather phenomena. Tornadoes can occur in any state in the U.S. but are more frequent in the Midwest, Southeast, and Southwest.

Tornadoes, by nature, strike at random. While it is known that some areas of the country experience tornadoes more than others, predicting exactly what parts of Laurens County have a greater chance of being struck by a tornado is difficult. The best predictor of future tornadoes is the occurrence of previous tornadoes. According to county records there have been at least twelve recorded tornado events in Laurens County since 1950. These tornadoes ranged EF0 to EF4 on the Fujita Tornado Measurement Scale, which categorizes tornadoes based on wind speed and expected damages. An EF1 tornado is considered a moderate tornado with wind speeds ranging from 73 to 112 mph and can cause damages such as moving cars off roads and mobile homes off of foundations. An EF2 tornado is a significant tornado with wind speeds from 113 to 157 mph a can cause considerable damages such as torn off roofs and uprooted trees. An EF3 tornado would have wind speeds in excess of 158 mph and would cause significant damage, and an EF4 would have even higher wind speeds and do more damage.

For planning purposes it is less important to map the tornado risk than it is to identify it. This is because it is so difficult to predict the path of future tornadoes. The Fujita scale provides us with an idea of the strength and extent of damages of tornadoes that can occur in Laurens County. An additional resource to help understand the extent of tornado risks is the "Design Wind Speed Map" developed by the American Society of Civil Engineers (ASCE). According to this map the entire state of South Carolina is located in Zone III, which is an area associated with up to 200-mph wind speeds.

*Drought**Threat level: High*

Drought refers to an extended period of deficient rainfall relative to the statistical mean for a region. Drought can be defined according to meteorological, hydrological, and agricultural criteria. Meteorological drought is qualified by any significant deficit of precipitation. Hydrological drought is manifest in noticeably reduced river and stream flow and critically low groundwater tables. The term agricultural drought indicates an extended dry period that results in crop stress and harvest reduction.

The Palmer Drought Severity Index (PDSI) is a widely used measure of drought in the United States to track moisture conditions. The PDSI is defined as “an interval of time, generally in months or years in duration, during which the actual moisture supply at a given place rather consistently falls short of the climatically expected or climatically appropriate moisture supply”. The range of PDSI is from -4.0 (extremely dry) to +4.0 (excessively wet), with the central half (-2.0 to +2.0) representing the normal or near normal conditions.

For the purposes of this risk assessment it is assumed that Laurens County has a moderate drought risk. The risk of drought is not targeted to any particular areas within the county. The latest report of the US Drought Monitor for South Carolina is included in the attachment.

*Hailstorms**Threat level: Low*

Hailstorms occur when freezing water in thunderstorm type clouds accumulates in layers around an icy core. Hail causes damage by battering crops, structures, automobiles, and transportation systems. When hailstorms are large (especially when combined with high winds), damage can be extensive. Based on available data at the state level it is assumed that the entire county is at moderate risk from hailstorms.

*Wildfires**Threat level: High*

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires.

Wildfire maps do not show the extent or range of where a wildfire will occur because they are dependent on the amount of fuel available, weather conditions, and wind speed and direction. As there is no historical record of wildfires in Laurens County this assessment does not map previous locations of wildfires as a determinant for future wildfire events. Based on available data at the state level it is assumed that the entire county is at moderate risk from wildfires.

*Structure Fires**Threat level: Low*

A structure fire is any instance of uncontrolled burning which results in major structural damage to residential, commercial, industrial, institutional, or other properties in developed areas. Municipalities with significant development in either a downtown area or an industrial park are prime targets for this type of occurrence. For the purposes of this risk assessment urban fire hazards will be considered moderate for the incorporated municipalities of the county.

*Tropical Systems**Threat level: Moderate*

The probability of a hurricane striking South Carolina is less than eight percent in any given year. Any or all counties could be affected with varying degrees of damage. The worst case scenario for Laurens County would be for a strong hurricane to strike the Beaufort/Savannah area and maintain strength as it moves inland quickly. Most of the storms that pass directly over the County approach from the southeast and have weakened considerably over time and the land mass. A map of historical tropical system tracks over the area is included in the Appendix.

Laurens County Selected Hazard Frequency 1960 - 2009

Hazard	Events	Years In Record	ReturnPeriod	Annual % Chance
Drought	33	59	1.78	55.93
Earthquake	6	310	51.66	1.93
Fire - wildfire hazard only	1054	21	0.01	5019.04
Flood	29	59	2.03	49.15
Fog	3	12	4	25
Funnel Cloud	3	16	5.33	18.75
Hail	89	59	0.66	150.84
Hazardous materials (Hazmat)--fixed facility and transportation	84	22	0.26	381.81
Hurricane/Tropical Storm	5	158	31.6	3.16
Lightning	7	16	2.28	43.75
Precipitation	32	15	0.46	213.33
Severe Winter Storm	6	59	9.83	10.16
Temperature Extremes	5	16	3.2	31.25
Thunderstorm & High Winds	208	59	0.28	352.54
Tornado	12	59	4.91	20.33
Transportation - motor vehicle	14116	10	0	141160

Source: SC Integrated Hazard Assessment Tool

B. Vulnerability Assessment

The vulnerability assessment uses the hazard profile information and combines it with community asset information to analyze and quantify potential damages from future hazard events. This process combines the final two steps of the risk assessment: the inventory of assets and the estimation of losses.

The vulnerability assessment evaluates each type of hazard based upon its frequency and severity to determine which hazards represent the greatest potential risk. The state EMD and the University of South Carolina Hazards Lab developed a format for each County to use to determine their most vulnerable areas. This process helped evaluate the hazard vulnerability of each county utilizing an index calculated from hazard event frequency and a social vulnerability score. This social vulnerability score utilizes data from the US Bureau of the Census (age, income, etc) to determine the social vulnerability. The most vulnerable areas in the County are the northern and western portions.

The overall determination from the risk assessment methodology utilized in this plan is that Laurens County is vulnerable to many types of hazards. Slight variations in terms of which hazards may pose the greatest risk exist depending on the analysis method utilized to assess the risk. The methodology suggests that potential vulnerability to multiple types of hazards exists, including winter storms, tornadoes, flooding, wildfire, hazardous materials, drought, and other forms of severe weather.

Included in the Appendix to this plan are maps showing county location, hazardous material sites, potential accident zones for fixed chemical facilities, composite social vulnerability, overall place vulnerability, and composite hazard zones. The chemical facilities map overlays major highways and railroads with the evacuation areas from chemical facilities. The composite social vulnerability map shows how certain Census criteria (age, income, etc.) determine geographic concentrations of people who have the highest potential for negative impact of natural hazards. The place vulnerability shows areas where there is high possibility for natural hazards. The most vulnerable places are

around the municipalities of Laurens and Clinton. The mapped composite map combines the previous two maps to show the most vulnerable parts of the county. In the case of Laurens County, the most vulnerable areas overall are around the municipalities of Laurens and Clinton, and the area between Gray Court and Fountain Inn.

1. Asset Inventory

The asset inventory identifies buildings, roads, and other facilities that can be damaged or affected by hazard events. In order to assess where and to what extent the identified hazards will affect the assets of Laurens County the locations of assets were identified and intersected with the mapped hazards in GIS.

The information source used to compile the asset inventory was the E-911 database and maps created by MSAG as part of the Laurens County E-911 addressing project. This project assigned street addresses to all structures and located them on maps in relation to identified roadways in the county.

According to the E-911 database and Census figures, there are approximately 40,000 structures throughout the county. Also taken from the E-911 database was the location of infrastructure including roadways, railroads, and utilities, which were also intersected with hazard data in GIS to determine vulnerability. Using the data supplied by the Laurens County Office of Emergency Management and local law enforcement, maps were developed to show the locations of critical facilities. Critical facilities are defined as facilities that are critical to the health and welfare of the county and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and schools. According to this data there are over 30 critical facilities in Laurens County.

Flood

According to the South Carolina Department of Natural Resources, there are no repetitive loss structures due to flooding in Laurens County. Riverine flooding is rare and occurs in areas with no structures or regular habitation. Rabun Creek and Little River are examples of this type of flooding. Urban storm water flooding is sporadic and does not consistently affect specific properties. Recent problems have occurred on Sunset Drive and Derby Lane.

Infrastructure layers were also intersected with floodplain data across the county to determine the location and amounts of vulnerable roadways, railroads, and utilities. These mapped areas are shown on the Overall Place Vulnerability maps in the appendix to this document.

Technological Hazards

The Hazardous Material Sites map shows the locations of facilities that store hazardous materials or extremely hazardous materials and their locations throughout the county. Hazardous materials are any substance or material that when involved in an accident and released in sufficient quantities, poses a risk to public health, safety, or property. Sites included in this map are based on data that was made available by the Laurens County Office of Emergency Preparedness. There are approximately 31 sites located in the county that store hazardous materials.

Non-Mapped Hazards

The remaining natural hazards (earthquake, winter storm, hailstorm, thunderstorm, windstorm, drought, wildfire, hurricane/tropical storm etc.) can be considered to have equal risk and impact throughout the county, therefore, an asset inventory was not conducted as all assets within the county would be considered at risk.

2. Loss Estimation

The final step in the risk assessment process is the loss estimation. This step helps to estimate the potential losses for any hazard event. Because the most likely hazards could occur at virtually any location in Laurens County, the loss estimations are generalized and cover the total impact a disaster may have on the population as a whole.

Laurens County Average Annual Losses by Hazard 1960-2011

Hazard	Property Damage	Crop Damage	Fatalities	Injuries
Drought	\$88,661	\$175,352	0	0
Flooding	\$124,517	\$7,794	0.019	0.004
Hail	\$25,548	\$8,732	0.009	0.008
Heat	\$84,332	\$124,418	0.026	0
Hurricane/Tropical Storm	\$6,413	\$507	0	0
Lightning	\$40,366	\$1,892	0.075	0.09
Severe Storm/Thunder Storm	\$87,129	\$25,877	0.01	0.065
Tornado	\$317,722	\$26,221	0	1.028
Wildfire	\$1,857	\$4,716	0	0
Wind	\$76,247	\$8,988	0.038	0.132
Winter Weather	\$102,073	\$369,124	0.06	0.044

Source: SC Integrated Hazard Assessment Tool

Future building locations are governed by building code regulations in Laurens County and by zoning in most of the municipalities. These regulations prevent the location of buildings in flood plains. Therefore, the only losses to future buildings should be in cases where random natural events like tornadoes or fires occur. Since these events are random, Laurens County and the municipal governments strive to place and secure future buildings in locations that offer them the best protection possible from natural hazards.

C. Analysis of Development Trends

Based on the analysis provided by the USC Hazards Lab and included in map form in the appendix, the most vulnerable area of the county (social and location) is in the extreme eastern portion east of Interstate 26. Fortunately, this is also one of the more lightly populated areas of the county due to the presence of the Sumter National Forest. It does however highlight the need to monitor growth changes along both interstate corridors thought the county. Industrial growth is occurring along Interstate 385 between Gray Court and Fountain Inn. This is expected to continue in the next five years and is not expected to cause a negative burden on existing resources or on vulnerable populations.

Laurens County lost population between 2000 and 2010. If there is new residential growth over the next five years, it will likely be widely dispersed in the northern and western parts of the county and not concentrated in any one location. The northern and western portions of the county have low to moderate place and social vulnerability rankings.

Commercial development is expected to be limited over the next five years and is most likely to occur within existing municipal boundaries or in the area between the cities of Laurens and Clinton. Growth in these areas poses no significant threat to existing populations or the services provided to them.

County and municipal comprehensive plans have been updated and their findings have been included in this plan. In the future Laurens County will try to determine how the growth areas in each of the municipalities and the county intersect with hazard areas and include this information in future plan updates.

V. CAPABILITIES ASSESSMENT

The capability assessment describes the legal authority vested in local governments to pursue measures to mitigate the impacts of natural hazards. This capability assessment focused on the evaluation of Laurens County's existing programs and policies to determine what vehicles are already in place to support mitigation activities. These policies and programs were identified based on a review of existing plans and ordinances for the county and each of the municipalities. Programs or regulations that related to mitigation or supported mitigation activities were selected. The following list the identified programs.

A. Laurens County	Emergency Management Office	Contact: Joey Avery
	Sheriff's Office	Ricky Chastain
	County Government	Ernest Segars
B. City of Laurens	Police	Sonny Ledda
	Fire	Bill Hughes
	City Government	Gary Coleman
C. Clinton	Public Safety	Robin Morse
	Fire	Scott Shiflet
	City Government	Frank Stovall

Comprehensive plans and municipal zoning ordinances exist in the municipalities of Laurens, Gray Court, and Clinton. Integrating mitigation concepts and policies with existing comprehensive plans provides and expanded means for implementing initiatives through established, legal frameworks. The foundation of these plans lies in the promotion of health, safety, efficiency, and well being for all segments of the population. Some of the primary plan objectives include preservation of the County's unique natural environment and historic heritage, creation of a stable and diverse economy, and promoting sustainable developments. The recently developed comprehensive plan for the county contains a natural resources element that was developed based on review and discussion about the hazard mitigation plan.

There is no county-wide zoning ordinance and there are no plans to develop one. Zoning can be used to restrict growth in high risk areas, allow low density development or designate only certain uses in hazard prone areas within the larger municipalities only. All the zoning ordinances require erosion control practices for ground disturbing activities, protection of existing waterways, and re-vegetation. These practices and others promote best management practices and reduce the risk of flooding hazard in particular.

The County does have a land development ordinance. This document supports hazard planning by regulating building construction in flood plains.

Building codes are important in mitigation because codes are developed for areas of the state in consideration of types, frequency and intensity of hazards present in that geographic region. Consequently, structures that are built to applicable codes are inherently resistant to many hazards like strong wind, floods, and earthquakes.

Intergovernmental cooperation is a great asset to the implementation of hazard mitigation actions. This way local, County, and State agencies can act as resources for each

other. Interaction between the County, towns, and regional planning organizations occurs in areas such as plan development and grant writing.

The major conclusion reached after conducting the capability assessment is that Laurens County will need to rely on technical and financial assistance from various resources to effectively implement hazard mitigation actions over the next five years. The constraints facing the County and especially the municipalities include both limited staff resources and extremely limited funding.

During this planning process, it is apparent that the County has a strong capability to bring together various groups to work together in crafting better communities of the future. The same cooperative effort, if joined with the appropriate technical and financial assistance from regional, state, and federal resources, can be harnessed to implement the priority hazard mitigation actions. A sustained effort by citizens, staff, and local officials can create a more sustainable and disaster resistant future.

Each of the local governments has the capacity to handle mitigation issues, but are limited due to funding and limited staff. The results of the capability assessment help to provide the framework for developing recommendation for specific mitigation actions. It also helps to identify shortfalls in the local government capabilities as well as draw attention to existing successes. The capability assessment was analyzed then used to rank the mitigation strategies according to the capability of the county or the municipalities to implement the actions.

Incorporation of the requirements of the mitigation plan into existing planning mechanisms

Existing Planning Mechanisms

Jurisdiction	Comprehensive Plan	Capital Improvement Plan	Building Code	Flood Hazard Ordinance	Zoning Ordinance	Emergency Operations Plan
Laurens County	Yes	No	Yes	Yes	No	Yes
Laurens City	Yes	No	Yes	Yes	Yes	No
Clinton City	Yes	Yes	Yes	Yes	Yes	No

There are several ways to incorporate the hazard mitigation plan requirements into the existing planning processes. First, the comprehensive plans are updated every five years and cover features of the jurisdictions such as natural resources and community facilities. Planning commissions within each jurisdiction revise the plans then recommend the revised plan to the local governing bodies for approval. Using this process, hazard mitigation elements can be included in plan updates.

One of the jurisdictions has a capital improvement plan. Capital improvement activities are usually included as part of the comprehensive plans in the other areas. The zoning ordinances are built from the findings of the comprehensive plan, so changes to the zoning ordinances can be made after the comprehensive plan is updated.

Updating the comprehensive plan would cover areas such as economic development, land use, natural resources, road construction and community facilities.

From that, then the zoning ordinance could reflect needed changes for issues such as development, land uses, storm water retention or road grading activities.

The emergency operations plans are maintained by the county emergency operations office. These plans can be updated and include hazard mitigation findings as they are updated by the county emergency preparedness directors.

Building codes are standard across the county and can be updated with hazard mitigation findings by the governing body of each local government. In addition, the state has adopted the Southern Building Code. As changes are made to the state building code by the state legislature local jurisdictions may adopt those changes and incorporate them into local building codes.

Each municipality has a floodplain ordinance. Revisions, which might include adoption of more stringent floodplain regulations, are accomplished through review and adoption by the City Council.

Public hearings, which provide an opportunity for public comment, are required prior to adoption of any of the above planning mechanisms.

VI. MITIGATION GOALS, OBJECTIVES, STRATEGIES AND PROJECTS

Using the findings from the risk assessment and the capabilities assessment as a guide the planning committee developed the following mitigation goals, objectives, and strategies for implementation. Goals and objectives were developed in a working session with the planning committee with a period provided for comment and revision. Once the final goals and objectives were determined the planning committee developed the mitigation strategies that would aid the county in meeting the goals and objectives identified in the plan. Strategies were selected using the information obtained from the capabilities assessment, which identified existing programs and shortfalls related to mitigation activities.

The committee reviewed the following existing plans and technical information before and during the update process: Laurens County Hazard Mitigation Plan, Laurens County Comprehensive Plan, municipal Comprehensive Plans, municipal Zoning Ordinances, municipal and county Flood Plain Ordinances, weather reports from the National Oceanographic and Atmospheric Administration and various instructional materials from the Federal Emergency Management Agency. Relevant information from these documents was placed at the pertinent location in this updated plan.

The goals for this plan are consistent with the hazard vulnerabilities as determined through the process laid out by SC EMD and the University of South Carolina. Sample goals were drawn from analysis of Mitigation 20/20 software provided by SC EMD. Working towards achieving all of these goals is expected to minimize hazard-related losses associated with any of the hazards for which Laurens County is potentially at risk. Projects will be assigned a priority and feasibility rank, in addition to having a listing of implementing agencies and a general timeframe for implementation.

The committee decided that they would take the entire existing plan and review it to start the update process. Each member of the committee was provided a copy of the draft plan for review and comment. In this section of the plan, it was felt that there needed to be changes to each of the goals. Most of the goals from last time had not yet been accomplished for a variety of reasons, mostly budgetary. A status update was added to each goal reflecting where the goal stood in reference to accomplishment. The committee also felt the need to add a line reflecting potential funding sources for each goal. Even though funding sources are similar, this was listed as an attempt to make each goal stand alone as a potential measure of accomplishment. Due to the small staff and limited budget, Laurens County has to make progress on a piecemeal basis. Laurens County and each municipality also added a goal to ensure continued compliance with NFIP.

Based on the recommendations of the Core Planning Team the following implementation schedule has been developed. Projects have been listed by priority according to the ranking assigned by the Core Planning Team (H=High, M=Medium, L=Low). Feasibility to implement the projects is based on the results of the capability assessment.

- High Priority Projects with High Feasibility.
- High Priority Projects with Medium Feasibility.
- Medium Priority Projects with High Feasibility.
- Medium Priority Projects with Medium Feasibility.
- Medium Priority Projects with Low Feasibility.
- Low Priority Projects.

The Core Planning Team ranked projects based on a cost-benefit review that showed which projects were most needed, which of these projects was the most likely to be accomplished, and which would most effectively address mitigation needs. In addition to

reviewing potential monetary costs, the team considered the social impact of each potential project, the technical capabilities of the local government to carry through the project, impact on the environment, ability of the local government to maintain the project, and any political or legal effects of the decision. This cost-benefit review was the basis for each of the project feasibility rankings.

One set of goals has been developed as opposed to separate goals for each jurisdiction would show the desire of the various agencies in the county to work together toward common goals. Weather impacts know no boundaries, and these goals are felt to benefit all parties.

Goal 1: The health, safety, and welfare of the community's residents and visitors will not be threatened by disasters.

Strategy: Inform the public of potential hazards and the actions they can take to reduce damage

Strategy: Improve coordination and communication among disaster response organizations and local governments.

Strategy: Improve training for first responders

Strategy: Plan for reaching the traveling public or temporary visitors in the event of a natural disaster.

Goal 2: The availability and functioning of the community's infrastructure will not be significantly disrupted by disaster.

Strategy: Ensure that all shelters and critical facilities have adequate emergency power resources.

Goal 3: The economic vitality of the community will not be threatened by a disaster

Strategy: Ensure critical facilities run as smoothly as possible after a disaster

Goal 4: Reduce the potential impact of natural and man-made disasters on private property.

Strategy: Educate and plan for taking basic steps to mitigate localized disasters

Goal 5: Reduce the potential impact of natural and man-made disasters on the county's historic properties.

Strategy: Protect and promote the historic resources of the county

Goal 6: Develop better hazard data for Laurens County and the municipalities.

Strategy: Improve basic data holdings related to Laurens County hazards.

Strategy: Increase awareness of hazardous materials risks throughout the county

Laurens County Mitigation Action Plan

Goal	Mitigation Action	Hazard Addressed	Priority and Time Frame	Potential/Current Funding Sources	Responsible Agency or Department	Milestones Achieved, Impediments to Implementation
1	Develop a traveling display to increase awareness of potential disasters	All	High On-going	General Fund, Local or federal grants	Laurens County EMA	Funding is still being researched to build and maintain this project.
1	The County will analyze and prioritize all future development, planning, and mitigation activities based on compliance with NFIP standards.	Flooding	High On-going	General Fund, Local or federal grants	Laurens County, Local Governments	This project is underway and on-going and dependent on funding of training opportunities.
1	Continue programs for children to teach them disaster awareness.	All	High On-going	General Fund, Local or federal grants	Laurens County EMA	This project is underway and on-going and dependent on funding.

Hazard Mitigation Plan

Laurens County, SC

Goal	Mitigation Action	Hazard Addressed	Priority and Time Frame	Potential/Current Funding Sources	Responsible Agency or Department	Milestones Achieved, Impediments to Implementation
1	Plan for and educate the public on what to do with their animals in the event of a natural disaster.	All	Medium On-going	General Fund, Local or federal grants	Laurens County EMA in partnership with local clubs, vet offices, and ag offices	This is a continuing project and relies on funding for materials and education
1	Use media to promote pre-disaster planning	All	High On-going	General Fund, Local or federal grants	Laurens County EMA, Local media	This project is underway and on-going and dependent on funding of training opportunities.
1	Continue programs to train the public for hazard preparation	All	Medium On-going	General Fund, Local or federal grants	Laurens County EMA, local media, SCEMD	This project is underway and on-going and dependent on funding.

Goal	Mitigation Action	Hazard Addressed	Priority and Time Frame	Potential/Current Funding Sources	Responsible Agency or Department	Milestones Achieved, Impediments to Implementation
1	Continue to review communications procedures on a regular basis.	All	High On-going	General Fund, Local or federal grants	Laurens County, municipal governments, First responders	This project is underway and on-going and dependent on funding of training opportunities.
1	Update communications equipment on a regular basis as funding is available.	All	High On-going	General Fund, Local or federal grants	Laurens County, Local Governments, First responders	This project is underway and on-going and dependent on funding of training opportunities.
1	Update equipment at existing E-911 Communications Center as needed and as funding is available.	All	High On-going	General Fund, Local or federal grants	Laurens County E911 Administration, County Government	This project is underway and on-going and dependent on funding.

Hazard Mitigation Plan

Laurens County, SC

Goal	Mitigation Action	Hazard Addressed	Priority and Time Frame	Potential/Current Funding Sources	Responsible Agency or Department	Milestones Achieved, Impediments to Implementation
1	Continue to research and take part in training for all First Responders	All	High On-going	General Fund, Local or federal grants	Laurens County, municipal governments, First responders	This project is underway and on-going and dependent on funding of training opportunities.
1	Purchase appropriate firefighting vehicles for countywide use and develop a replacement schedule	All	High On-going	Fire Fund, Local or federal grants	Laurens County, Local Governments, Fire Departments	This project is underway and on-going and dependent on continued funding.
1	Notify campers and travelers of impending weather events	All	Medium On-going	General Fund, Local or federal grants	Laurens County EMA	This project is being researched and is dependent on funding.

Hazard Mitigation Plan

Laurens County, SC

Goal	Mitigation Action	Hazard Addressed	Priority and Time Frame	Potential/Current Funding Sources	Responsible Agency or Department	Milestones Achieved, Impediments to Implementation
1	Expand the weather warning system through the use of cell phone and mass notification.	All	High On-going	General Fund, Local or federal grants	Laurens County EMA	This project is being researched for the best alternatives for the county.
2	Upgrade all shelter resources to include emergency generators.	All	High On-going	General Fund, Local or federal grants	Laurens County EMA and facilities	This project is being researched and is dependent on funding availability.
2	Continue to ensure that all existing shelters and critical facilities can communicate with EOC in the event of a natural disaster. Upgrade communications equipment as necessary.	All	High On-going	General Fund, Local or federal grants	Laurens County EMA and facilities	This project is being researched and is dependent on funding availability for equipment.

Hazard Mitigation Plan

Laurens County, SC

Goal	Mitigation Action	Hazard Addressed	Priority and Time Frame	Potential/Current Funding Sources	Responsible Agency or Department	Milestones Achieved, Impediments to Implementation
3	Provide generators to all existing critical facilities to prevent lengthy power outages.	All	High On-going	General Fund, Local or federal grants	Laurens County EMA and facilities	This project is being carried forward due to the cost of the generators and limited budgets.
3	Continue to include utility providers in all planning and drills for mitigation planning	All	Medium On-going	General Fund, Local or federal grants	Laurens County EMA and utility providers	This project is underway and on-going.

Hazard Mitigation Plan

Laurens County, SC

Goal	Mitigation Action	Hazard Addressed	Priority and Time Frame	Potential/Current Funding Sources	Responsible Agency or Department	Milestones Achieved, Impediments to Implementation
3	Ensure emergency power sources are available at all utility providers.	All	High On-going	General Fund, Local or federal grants	Individual utility providers	Due to budget constraints, this project is carried over from previous years.
3	Continue to regularly inspect roads and bridges throughout the county to ensure they are ready for extra service if a disaster strikes.	All	High On-going	General Fund, Local or federal grants	SCDOT, County and Municipal governments	This project is on-going.
3	Review local government comprehensive plans and ordinances to ensure that they include provisions for pre- and post-disaster planning.	All	Medium On-going	General Fund, Local or federal grants	Laurens County and municipalities with input from Laurens County EMA	This project is underway and on-going.

Hazard Mitigation Plan

Laurens County, SC

Goal	Mitigation Action	Hazard Addressed	Priority and Time Frame	Potential/Current Funding Sources	Responsible Agency or Department	Milestones Achieved, Impediments to Implementation
4	Continue to work with local governments to target storm water problem areas	Flood	High On-going	General Fund, Local or federal grants	County and municipal governments with input from Laurens County EMA	Due to budget constraints and limited resources, this goal is carried forward.
4	As necessary, purchase equipment needed to clear ditches or replace storm drains.	Flood	Medium priority Medium feasibility	General Fund, Local or federal grants	SCDOT with County and municipal governments	Due to budget constraints and limited resources, this goal is carried forward.
4	Review existing ordinances related to storm water and update them as necessary.	Flood	Medium priority Medium feasibility	General Fund, Local or federal grants	Laurens County and municipalities with input from Laurens County EMA	This project is underway and on-going.

Hazard Mitigation Plan

Laurens County, SC

Goal	Mitigation Action	Hazard Addressed	Priority and Time Frame	Potential/Current Funding Sources	Responsible Agency or Department	Milestones Achieved, Impediments to Implementation
4	Continue outreach to mobile home parks with pre- and post-disaster information.	All	High On-going	General Fund, Local or federal grants	County and municipal governments with input from Laurens County EMA	This project is underway and on-going. Mass notification system implementation will help with this goal.
4	Develop all promotional materials in Spanish as well as English.	All	High priority On-going	General Fund, Local or federal grants	Laurens County EMA	Due to budget constraints and limited resources, this goal is carried forward.
4	Adequately support and enforce existing building code programs.	All	Medium priority On-going	General Fund, Local or federal grants	Laurens County and municipalities	This project is underway and on-going.

Hazard Mitigation Plan

Laurens County, SC

Goal	Mitigation Action	Hazard Addressed	Priority and Time Frame	Potential/Current Funding Sources	Responsible Agency or Department	Milestones Achieved, Impediments to Implementation
5	Maintain information on historic properties that may be endangered by natural hazards	All	Medium priority On-going	General Fund, Local or federal grants	County and municipal governments with input from Laurens County EMA	This project is underway and on-going.
5	Plan for the protection of historic structures in case of natural disasters	All	Medium priority On-going	General Fund, Local or federal grants	County and municipal governments with input from Laurens County EMA	This project is underway and on-going.
6	Utilize FIRM maps to assist in locating and documenting flood prone areas	Flood	Medium priority Medium time frame	General Fund, Local or federal grants	Laurens County and municipalities	This project is underway and on-going. These maps are now available online.

Hazard Mitigation Plan

Laurens County, SC

Goal	Mitigation Action	Hazard Addressed	Priority and Time Frame	Potential/Current Funding Sources	Responsible Agency or Department	Milestones Achieved, Impediments to Implementation
6	Maintain contacts with representatives of rail lines to collect information about emergency planning and risks associated with rail services in the County.	Hazardous Material Spill	High On-going	General Fund, Local or federal grants	Laurens County EMA	This project is underway and on-going.
6	Conduct a hazardous materials survey to identify all hazardous materials that are stored in the county	Hazardous Materials Spill	High On-going	General Fund, Local or federal grants	Laurens County EMA, Local Emergency Planning Committee	This project being researched.

VII. Plan Implementation and Maintenance Procedures

Maintenance

According to the Disaster Mitigation Act of 2000 local plans are required to develop a method and schedule of monitoring, evaluating, and updating the hazard mitigation plan within a five-year cycle. This cycle corresponds to the five-year updates required for comprehensive plans if the County decides to undertake one.

Monitoring

Using the implementation schedule developed for the mitigation projects, the Laurens County Council in cooperation with Laurens County Hazard Mitigation Planning Team shall meet on a regular basis to track the progress of the mitigation plan. Status reports shall be submitted to the County Council by each of the strategy implementation agencies also on a yearly basis which detail efforts to date and any challenges they are experiencing in implementing the mitigation projects. The County Council and Laurens County Hazard Mitigation Planning team will be responsible for tracking the progress of the implementing agencies and ensuring adherence to the plan time line.

The committee reviewed the following existing plans and technical information before and during the update process: Laurens County Hazard Mitigation Plan, Laurens County Comprehensive Plan, municipal Comprehensive Plans, municipal Zoning Ordinances, municipal and county Flood Plain Ordinances, weather reports from the National Oceanographic and Atmospheric Administration and various instructional materials from the Federal Emergency Management Agency. Relevant information from these documents was placed at the pertinent location in this updated plan.

The committee decided that they would take the entire existing plan and review it to start the update process. Members of the committee were given this section and asked for their review and comment. The members of the committee decided that the plan maintenance section of the plan did not need to be changed. The members of the committee felt confident that this section of the plan was able to carry forward without changes. As time and budgets permit, the committee would like for regular updates to the plan to be made within the five-year time period.

Evaluation

On an annual basis the County Council and the Laurens County Hazard Mitigation Planning team will coordinate to develop an end-of year report. The report should detail mitigation activities undertaken over the course of the year as well as any mitigation projects that have been completed. Any mitigation success stories should be highlighted. The report should also address the following points:

- Evaluate the goals and objectives to ensure they address current and expected conditions;
- Determine if the nature or magnitude of risk has changed.
- Evaluate whether the current resources are adequate for implementing the plan.
- Document any implementation problems such as technical, political, legal, or coordination issues with other agencies.
- Discuss whether the outcomes have occurred as expected.
- Document agency and other partner participation.
- Document public participation opportunities.

Copies of the annual report should be made available to each of the implementing agencies, local governments, citizens, SC EMD and FEMA. In addition, to maintain public involvement during the plan monitoring and evaluation process, the public will be invited to attend all meetings of the Hazard Mitigation Planning Committee. During the meetings the public will be provide an opportunity to comment on the implementation and evaluation of the plan. The public will be notified of the meetings through public notices in a daily newspaper available in the County.

Update

The plan should be updated every five years after the adoption date. In the event of a significant disaster or any substantial changes in land use planning or regulations that would impact the recommended mitigation projects, more frequent updates should be considered. The Core Planning Team in partnership with the local planning departments, emergency management, and Laurens County would be responsible for overseeing the update of the hazard mitigation plan. The update process would be similar to the one used to develop the original plan and would incorporate opportunities for public involvement. The public will be asked to comment in general on mitigation needs of the community through public hearings advertised in the newspaper and/or by other means of communication. Then the public will have the opportunity to review the suggested changes, and public comments will be included in the final document.

Due to limitations in staff time and funding, there have been limited opportunities to accomplish hazard mitigation plans and goals in the past five years. Moving forward, staff has committed to reviewing goals and the plan at least twice annually with the committee and documenting activities for goal accomplishment.

Critical Facilities List

Fire Departments

Laurens City	Hickory Tavern	Western Laurens
Cross Hill	Joanna	Youngs
Durbin Creek	Laurens County	Fountain Inn
Ekom	Mountville	Enoree
Clinton	Renno	Clinton Public Safety
Gray Court	Sandy Springs	Laurens County
Greenpond	Waterloo	

Municipal Buildings

Laurens City Hall	Gray Court Town Hall
Laurens Police/SunTrust Bldg	Cross Hill Town Hall
Clinton City Hall/Bailey Bldg	Waterloo Community Center
Clinton Public Safety Bldg	

County Buildings

Historic Courthouse	Hillcrest Judicial Services Facility
E-911 Dispatch/S. Harper St Building and Emergency Operations Center	
Johnson Detention Center	
Law Enforcement Center	Church Street Complex
Judicial Center	EMS Stations
Laurens County Piedmont Technical College Higher Education Center	

Utilities

Laurens County Water and Sewer Commission	Laurens Electric Co-op
Laurens CPW	Saluda River Co-op
City of Clinton Public Works	Clinton Newberry Gas Authority

Schools

Laurens High	E.B. Morse Elementary	Clinton Elem.
Laurens Middle	Hickory Tavern Elem.	Eastside Elem.
Sanders Middle	Pleasant View Elem.	Joanna-Woodson Elem.
Hickory Tavern Middle	Waterloo Elem.	Bailey Elem.
Gray Court - Owings Elem.	Clinton High	Thornwell
Laurens Elementary	Faith Christian	
Ford Elementary	Laurens Academy	
Ware Shoals Elem.	Old Clinton High	

Laurens County Hospital**Area Nursing Homes and Assisted Living Facilities**