



Eno-Haw Regional Hazard Mitigation Plan

Alamance County, Orange County, Durham County

Prepared by:
Eno-Haw Hazard Mitigation Planning Team
With Professional Planning Assistance from
AECOM



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Acknowledgements

This regional hazard mitigation plan was made possible through the dedicated efforts of each participating jurisdiction, stakeholders, members of the public, and the project consultant. Detailed information about the planning process and individual participation can be found in the *Planning Process* section of this document.

Participating county and municipal jurisdictions are listed here in alphabetical order by county.

Alamance County

Village of Alamance
City of Burlington
Town of Elon
City of Graham
Town of Green Level
Town of Haw River
City of Mebane
Town of Ossipee
Town of Swepsonville

Orange County

Town of Carrboro
Town of Chapel Hill
Town of Hillsborough

Durham County

City of Durham

Special thanks and recognition is also given to the **State of North Carolina**, Department of Public Safety, Division of Emergency Management for making funding available to support this planning process.

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Section 1: Introduction

This section provides a general introduction to the Eno-Haw Regional Hazard Mitigation Plan. It consists of the following five subsections:

- 1.1 Background
- 1.2 Purpose and Vision
- 1.3 Scope
- 1.4 Authority
- 1.5 Plan Overview

1.1 Background

Natural hazards, such as floods, severe winter storms, and hurricanes are a part of the world around us. Their occurrence is natural and inevitable, and in most cases there is little we can do to control their force and intensity. We must consider these hazards to be legitimate and potentially significant threats to human life, safety, and property.

The Eno-Haw Region, which is comprised of Alamance, Orange, and Durham counties, is vulnerable to a wide range of natural hazards. These hazards threaten the life and safety of the Region's residents, and have the potential to damage or destroy both public and private property and disrupt the local economy and overall quality of life. These hazards are fully introduced in Section 4: *Risk Assessment*.

While the threat from potentially hazardous events may never be fully eliminated, there is much we can do to lessen their impact on our communities and our citizens. By minimizing the damaging effects of natural hazards upon our built environment, we can prevent such events from resulting in disasters. The concept and practice of reducing risks to people and property from known hazards is referred to as hazard mitigation. Hazard mitigation is defined by the Federal Emergency Management Agency (FEMA) as, "Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards."

Hazard mitigation techniques include structural measures as well as non-structural measures. Structural measures include activities such as strengthening or protecting buildings and infrastructure from the destructive forces of potential hazards. Non-structural measures include activities such as the adoption of sound land use policies and the creation of public awareness programs. It is widely accepted that the most effective mitigation measures are implemented at the local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive mitigation approach addresses hazard vulnerabilities that exist today and in the foreseeable future. Therefore it is essential that projected patterns of future development are evaluated and considered in terms of how that growth will increase or decrease overall hazard vulnerability in the planning area.

One of the most effective means that a community can use to implement a comprehensive approach to hazard mitigation is to develop, adopt, and update as needed, a local hazard mitigation plan. A hazard mitigation plan establishes the broad local vision and guiding principles for reducing hazard risk, and further proposes specific mitigation actions to eliminate or reduce identified vulnerabilities. It is important to note that other, more detailed, local documents may exist that provide extra detail on specific hazards, such as a stand-alone flood study, wildfire protection plan,

Emergency Operations Plans (EOPs), or other such plans, studies, and reports. This hazard mitigation plan is not intended to replace or supersede other such documents, but rather to provide a framework upon which to base a solid local mitigation program.

The Eno-Haw Regional Hazard Mitigation Plan (hereinafter referred to as “Hazard Mitigation Plan” or “Plan”) is an effective means to incorporate hazard mitigation principles and practices into the routine government activities and functions of the three counties and 14 municipalities participating in this Plan. At its most inner core, the Plan recommends specific actions to protect our built environment from the forces of nature and to protect the residents of the Eno-Haw Region from losses to those hazards that pose the greatest risk. These mitigation actions go beyond simply recommending structural solutions to reduce existing vulnerability, such as elevation, retrofitting, and acquisition projects. Local policies on community growth and development, incentives for natural resource protection, and public awareness and outreach activities are examples of other actions considered to reduce the Eno-Haw Region’s future vulnerability to identified hazards. The Plan is designed to be a living document, with implementation and evaluation procedures included to help achieve meaningful objectives and successful outcomes over time.

Disaster Mitigation Act of 2000

In an effort to reduce the nation's mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act by invoking new and revitalized approaches to mitigation planning. Section 322 of the Act emphasizes the need for state and local government entities to closely coordinate on mitigation planning activities, and makes the development of a hazard mitigation plan a specific eligibility requirement for any local government applying for federal mitigation grant funds. Communities with an adopted and federally approved hazard mitigation plan thereby become pre-positioned and more apt to receive available mitigation funds before and after the next declared disaster.

This Plan was prepared in coordination with FEMA and the North Carolina Division of Emergency Management (NCEM) to ensure that it meets all applicable planning requirements. This includes conformance with FEMA’s latest *Local Mitigation Planning Handbook* (released March 2013) and *Local Mitigation Plan Review Guide* (released October 2011). A *Local Hazard Mitigation Plan Update Checklist*, found in Appendix B, provides a summary of FEMA and NCEM’s current minimum standards of acceptability and notes the location within the Plan where each planning requirement is met.

1.2 Purpose and Vision

The general purpose of this Hazard Mitigation Plan is:

- To protect life and property by reducing the potential for future damages and economic losses that result from natural hazards;
- To qualify for additional grant funding, in both the pre-disaster and post-disaster environment;
- To speed recovery and redevelopment following future disaster events;
- To sustain and enhance existing governmental coordination in the Eno-Haw Region and demonstrate a firm local commitment to hazard mitigation principles; and
- To comply with federal and state requirements for local hazard mitigation plans.

The Eno-Haw Hazard Mitigation Planning Team was created, consisting of representatives from each of the 17 participating jurisdictions and other key stakeholders, to develop a regional plan. This committee established a vision statement to help guide the regional planning process and to give all of the participating jurisdictions a common focal point for discussion, coordination, and development of the Plan:

Vision Statement

“Through a coordinated regional planning effort, create and implement an effective hazard mitigation plan that will identify and reduce risk to natural hazards in order to protect the health, safety, quality of life, environment and economy of the Alamance, Orange, and Durham county area.”

1.3 Scope

This Hazard Mitigation Plan will be updated and maintained to continually address the hazards determined to be of high and moderate risk through the detailed vulnerability assessment for the Eno-Haw Region, and consistent with the hazards addressed by the State of North Carolina (see Section 4: *Risk Assessment*). Other hazards that pose a low or negligible risk will continue to be evaluated during future updates to the Plan, but they may not be fully addressed until they are determined to be of high or moderate risk to the Eno-Haw Region.

The geographic scope (i.e., the “planning area”) for the Plan includes all incorporated and unincorporated areas of Alamance, Orange, and Durham counties. This includes the following 16 local government jurisdictions:¹

Alamance County

- Village of Alamance
- City of Burlington
- Town of Elon
- City of Graham
- Town of Green Level
- Town of Haw River
- City of Mebane
- Town of Ossipee
- Town of Swepsonville

Orange County

- Town of Carrboro
- Town of Chapel Hill
- Town of Hillsborough

Durham County

- City of Durham

¹ The University of North Carolina at Chapel Hill previously completed a stand-alone hazard mitigation plan in 2006 under a Pre-Disaster Mitigation (PDM) grant from FEMA. This separate study covers 12 natural hazards and is included as an appendix to this Plan for reference. In some cases, risk assessment results are broken out separately for the UNC-Chapel Hill campus to provide additional accuracy in the regional risk assessment.

These 16 participating jurisdictions have previously been covered under three separate county level plans and a separate stand-alone plan for the City of Chapel Hill. The decision was made to create one regional mitigation plan in order to accomplish the following planning goals:

- Support a more holistic regional planning effort, taking into account shared concerns and shareable resources;
- Conform to NCEM's preference for regional hazard mitigation planning in the state; and
- Leverage available funding and resources for mitigation planning.

1.4 Authority

This Hazard Mitigation Plan has been adopted by all participating counties in accordance with the authority and police powers granted to counties as defined by the State of North Carolina (N.C.G.S., Chapter 153A). This Hazard Mitigation Plan has also been adopted by all participating incorporated municipal jurisdictions under the authority granted to cities and towns as defined by the State of North Carolina (N.C.G.S., Chapter 160A). Copies of all local resolutions to adopt the Plan are included in Appendix A.

This Plan was developed in accordance with current state and federal rules and regulations governing local hazard mitigation plans. The Plan shall be monitored and updated on a routine basis to maintain compliance with the following legislation:

- Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390) and by FEMA's Interim Final Rule published in the Federal Register on February 26, 2002, at 44 CFR Part 201.
- North Carolina General Statutes, Chapter 166A: North Carolina Emergency Management Act, as amended by Senate Bill 300: An Act to Amend the Laws Regarding Emergency Management as Recommended by the Legislative Disaster Response and Recovery Commission (2001).

1.5 Plan Overview

This Hazard Mitigation Plan is divided into eight major sections, each of which is described briefly below. The Plan also includes several appendices for additional or supplemental items not included in the main body of the Plan, including copies of local adoption resolutions (Appendix A), a completed *Local Hazard Mitigation Plan Update Checklist* (Appendix B), Public Outreach Strategy (Appendix C), public participation survey results (Appendix D), copies of meeting agendas, sign-in sheets, and PowerPoint slides (Appendix E), etc.

This *Introduction* (Section 1) provides background on hazard mitigation planning and the Disaster Mitigation Act of 2000, and defines the purpose, scope, and authority of the Plan as adopted by all participating jurisdictions. It also provides the following outline of each section making up the Plan.

The *Planning Process*, found in Section 2, fully documents the process by which the Eno-Haw Region prepared this regional hazard mitigation plan as an update to its three existing county level plans and the incorporation of the Town of Chapel Hill. This includes a description of the key steps

involved in the processes followed, who was involved (i.e., the members of the Hazard Mitigation Planning Team) and full descriptions of community meetings and workshops, how the public and other stakeholders were notified and involved, and how each of the municipal jurisdictions participated in the process.

The *Planning Area Profile*, located in Section 3, describes the general makeup of the Eno-Haw Region, including its counties and local municipalities, including relevant geographic, demographic, and economic characteristics. In addition, building characteristics and land use patterns are discussed along with general historical disaster data. This baseline information provides context for the region-wide planning area and thereby assists the planning team in recognizing the social, environmental, and economic factors that ultimately play a role in determining community vulnerability to natural hazards.

The *Risk Assessment*, found in Section 4, serves to identify, analyze, and assess the Eno-Haw Region's overall risk to natural hazards. The *Risk Assessment* also attempts to define any hazard risks that may uniquely or exclusively affect the individual municipal jurisdictions. The *Risk Assessment* builds on available historical data from past hazard occurrences, establishes detailed profiles for each hazard, and culminates in a hazard risk ranking based on conclusions about the frequency of occurrence, spatial extent, and potential impact of each hazard. In essence, the information generated through the *Risk Assessment* serves a critical function as communities seek to determine the most appropriate mitigation actions to pursue and implement—enabling communities to prioritize and focus their efforts on those hazards of greatest concern and those structures or areas facing the greatest risk(s).

The *Capability Assessment*, located in Section 5, provides a comprehensive examination of the Eno-Haw Region and the participating municipalities' capacity to implement meaningful mitigation strategies and identifies existing opportunities to increase and enhance that capacity. Specific capabilities addressed in this section include planning and regulatory capability, staff, and organizational (administrative) capability, technical capability, fiscal capability, and political capability. Information was obtained through the use of detailed survey questionnaires for local officials and an inventory and analysis of existing plans, ordinances, and relevant documents. The purpose of this assessment is to identify any existing gaps, weaknesses, or conflicts in programs or activities that may hinder mitigation efforts, and to identify those activities that should be built upon (such as participation in the National Flood Insurance Program [NFIP]) in establishing a successful and sustainable community hazard mitigation program. The *Community Profile*, *Risk Assessment*, and *Capability Assessment* collectively serve as a basis for determining the goals for the Hazard Mitigation Plan, each contributing to the development, adoption, and implementation of a meaningful *Mitigation Strategy* that is based on accurate background information.

The *Mitigation Strategy*, found in Section 6, consists of regional goal statements as well as specific mitigation actions for each local government jurisdiction participating in the planning process, along with a set of regional mitigation actions to be implemented by the Eno-Haw Hazard Mitigation Planning Team. The *Mitigation Strategy* provides the foundation for detailed *Mitigation Action Plans*, found in Section 7, that link specific mitigation actions for each jurisdiction to locally assigned implementation mechanisms and target completion dates. Together, these sections are designed to make the Plan both strategic (through the identification of long-term goals) and also functional through the identification of short-term and immediate actions that will guide day-to-day decision-making and project implementation.

In addition to the identification and prioritization of possible mitigation projects, emphasis is placed on the use of program and policy alternatives to help make the Eno-Haw Region less vulnerable to the damaging forces of nature while improving the economic, social, and environmental health of the community. The concept of multi-objective planning was emphasized throughout the planning process, particularly in identifying ways to link hazard mitigation policies and programs with complimentary community goals related to housing, economic development, downtown revitalization, recreational opportunities, transportation improvements, environmental quality, land development, and public health and safety.

The *Plan Maintenance Procedures*, found in Section 8, includes the measures each participating jurisdiction will take to ensure the Plan's continuous long-term implementation. The procedures also include the manner in which the Plan will be regularly evaluated and updated to remain a current and meaningful planning document.

Section 2: Planning Process

This section of the Plan describes the mitigation planning process undertaken by the Eno-Haw Region in preparing the Hazard Mitigation Plan. It consists of the following eight subsections:

- 2.1 Overview of Hazard Mitigation Planning
- 2.2 History of Hazard Mitigation Planning in the Eno-Haw Region
- 2.3 Preparing the Regional Plan
- 2.4 Eno-Haw Hazard Mitigation Planning Team
- 2.5 Meetings and Workshops
- 2.6 Involving the Public
- 2.7 Involving Stakeholders
- 2.8 Documentation of Plan Progress

2.1 Overview of Hazard Mitigation Planning

Local hazard mitigation planning is the process of organizing community resources, identifying and assessing hazard risks, and determining how to best minimize or manage those risks. This process results in a hazard mitigation plan that identifies specific mitigation actions, each designed to achieve short-term planning objectives as well as a long-term community vision. To ensure the functionality of each mitigation action, responsibility is assigned to a specific individual, department, or agency along with a schedule for its implementation. Plan Maintenance Procedures (found in Section 8) are established for the routine monitoring of implementation progress, as well as the evaluation and enhancement of the mitigation plan itself. These Plan Maintenance Procedures ensure that the Plan remains a current, dynamic, and effective planning document over time.

Mitigation planning offers many benefits, including:

- Saving lives and property;
- Saving money;
- Speeding recovery following disasters;
- Reducing future vulnerability through wise development and post-disaster recovery and reconstruction;
- Expediting the receipt of pre-disaster and post-disaster grant funding; and
- Demonstrating a firm commitment to improving community health and safety.

Typically, mitigation planning is described as having the potential to produce long-term and recurring benefits by breaking the repetitive cycle of disaster loss. A core assumption of hazard mitigation is that pre-disaster investments will significantly reduce the demand for post-disaster assistance by lessening the need for emergency response, repair, recovery, and reconstruction. Furthermore, mitigation practices will enable local residents, businesses, and industries to re-establish themselves in the wake of a disaster, getting the community economy back on track more quickly and with less interruption.

The benefits of mitigation planning go beyond solely reducing hazard vulnerability. Measures such as the acquisition or regulation of land in known hazard areas can help achieve multiple community goals, such as preserving open space, maintaining environmental health, and enhancing recreational opportunities. Thus, it is vitally important that any local mitigation planning process be integrated with other concurrent local planning efforts, and any proposed mitigation strategies must take into account other existing community goals or initiatives that will help complement or hinder their future implementation.

2.2 History of Hazard Mitigation Planning in the Eno-Haw Region

Each of the three counties participating in this Plan, along with their incorporated municipal jurisdictions, as well as the Town of Chapel Hill, had a previously approved hazard mitigation plan in place prior to the start of this regional planning effort. The FEMA approval dates for each of these plans, along with a list of their participating municipalities, are listed below.

- *Alamance County Hazard Mitigation Plan* (November 2010)
 - Town of Alamance
 - City of Burlington
 - Town of Elon
 - City of Graham
 - Town of Green Level
 - Town of Haw River
 - City of Mebane
 - Town of Ossipee
 - Town of Swepsonville
- *Orange County Hazard Mitigation Plan* (July 2010)
 - Town of Carrboro
 - Town of Chapel Hill
 - Town of Hillsborough
- *Durham County Hazard Mitigation Plan* (October 2012)
 - City of Durham
- *Town of Chapel Hill Hazard Mitigation Plan* (June 2011)¹

Each of the plans listed above was developed using the multi-jurisdictional mitigation planning process recommended by FEMA. For this regional plan, all of the jurisdictions listed above have agreed to merge, update, and expand their existing mitigation planning content as part of one new regional format. No new jurisdictions have joined the planning process since the plans above were adopted and all of the jurisdictions that participated in previous planning efforts have agreed to participate in this regional planning effort. The specific process of moving forward with one regional approach is described in more detail in the following subsections.

¹ As previously stated, the University of North Carolina at Chapel Hill completed a stand-alone hazard mitigation plan in 2006 under a Pre-Disaster Mitigation (PDM) grant from FEMA. This separate study covers 12 natural hazards and is included as an appendix to this Plan for reference.

2.3 Preparing the Regional Plan

Hazard mitigation plans are required by FEMA to be updated every five years in order for the jurisdictions covered under them to remain eligible for federal mitigation and public assistance funding. To simplify and enhance planning efforts for the jurisdictions in the Eno-Haw Region, Alamance, Orange, and Durham counties made the decision to move forward with the creation of the Eno-Haw Regional Hazard Mitigation Plan. This regional approach allows resources to be shared amongst the participating jurisdictions and eases the administrative duties of all of the participants by combining the existing local plans, and the requirements for the five-year plan update, into one consolidated regional planning process.

To help prepare the Eno-Haw Regional Hazard Mitigation Plan, AECOM was hired as a consultant to provide professional mitigation planning services. Per the contractual scope of work, the consultant team followed the mitigation planning process recommended by FEMA and recommendations provided by North Carolina Division of Emergency Management (NCEM) mitigation planning staff. The *Local Mitigation Plan Review Checklist*, found in Appendix B, provides a detailed summary of FEMA's current minimum standards of acceptability for compliance with DMA 2000 and notes the location where each requirement is met within this Plan. These standards are based upon FEMA's Interim Final Rule as published in the Federal Register on February 26, 2002 in Part 201 of the Code of Federal Regulations (CFR). The planning team used FEMA's *Local Mitigation Planning Handbook* (released March 2013) for reference as they completed the Plan.

Because each participating jurisdiction had already developed a plan in the past, the combination of the existing plans into one regional plan required the making of some plan update revisions in addition to newly created content. Since this is the first regional mitigation plan amongst the participating jurisdictions, key elements from the previous approved plans are referenced throughout the document (e.g., existing mitigation actions) and required a discussion of changes made. For example, all of the risk assessment elements needed to be updated to include most recent information and any data that was standardized across the regional planning area. It was also necessary to formulate a single set of goals for the region. The *Capability Assessment* (Section 5) includes updated information for all of the participating jurisdictions and the *Mitigation Action Plan* section (Section 7) provides implementation status updates for all of the actions identified in the previous plans.

The process used to prepare this Plan included six major steps that were completed over the course of approximately eight months beginning in August 2014 and ending in March 2015. Each of these planning steps (illustrated in **Figure 2.1**) resulted in critical work products and outcomes that collectively make up the Plan.

Figure 2.1: Mitigation Planning Process for the Eno-Haw Region



2.4 Eno-Haw Hazard Mitigation Planning Team

In order to guide the development of this Plan, the Eno-Haw counties (Alamance County, Orange County, and Durham County) created the Eno-Haw Hazard Mitigation Planning Team (HMPT). This planning team represented a community based committee made up of representatives from various county departments and municipalities and other key stakeholders identified to serve as critical partners in the planning process.

Beginning in August 2014, the planning team members engaged in regular discussions as well as local meetings and planning workshops to discuss and complete tasks associated with preparing the Plan. This working group coordinated on all aspects of plan preparation and provided valuable input to the process. In addition to regular meetings, planning team members routinely communicated and were kept informed through an email distribution list and a project information website (<http://www.orangecountync.gov/emergency/Eno-HawRHMP.asp>).

Specifically, the tasks assigned to the Eno-Haw Hazard Mitigation Planning Team included:

- Participate in hazard mitigation planning team meetings and workshops (described in more detail in subsection 2.5);
- Provide best available data as required for the *Risk Assessment* portion of the Plan;
- Complete the *Local Capability Assessment Survey*, *National Flood Insurance Program (NFIP) Survey*, and *Safe Growth Survey* and provide copies of any mitigation or hazard-related documents for review and incorporation into the Plan;
- Support the development of the *Mitigation Strategy* portion of the Plan, including the design and adoption of a regional vision statement and regional mitigation goal statements;
- Review the existing mitigation actions from each previously adopted plan, provide an update on those previously adopted mitigation actions, and propose new mitigation actions for their department/agency for incorporation into the new regional Plan;
- Review and provide timely comments on all study findings and draft plan deliverables; and
- Support and facilitate the adoption of the Eno-Haw Regional Hazard Mitigation Plan.

Table 2.1 lists the members of the HMPT who were responsible for participating in the development of the Plan. Planning team members are generally listed by jurisdiction in Table 2.1 for ease of organizing and presenting the information but it should be noted that the committee worked extremely well as one regional unit thinking beyond traditional jurisdictional boundaries to focus on the mitigation planning issues and tasks at hand.

Table 2.1: Members of the Eno-Haw Hazard Mitigation Planning Team

Jurisdiction or Agency	Representative	Department, Title, or Role
PROJECT LEAD	Kirby Saunders	Orange County Emergency Management Coordinator
ALAMANCE COUNTY	John Payne	Alamance County Assistant EM Coordinator
Town of Alamance	Ben York	Town Clerk
City of Burlington	Roger Manuel	Emergency Management Director
Town of Elon	Sean Tencer	Town Planner
City of Graham	Melissa Guilbeau/Nathan Page	City Planner
Town of Green Level	Quentin McPhatter	Town Administrator
Town of Haw River	Jeff Earp	Town Manager
City of Mebane	David Cheek	City Manager
Town of Ossipee	Richard Overman	Financial Officer
Town of Swepsonville	Raymond Herring	Mayor
ORANGE COUNTY	Josh Hollingsworth	Emergency Management Planner
Town of Carrboro	Travis Crabtree	Fire Chief
Town of Chapel Hill	Matt Sullivan	Emergency Management Coordinator
Town of Hillsborough	Jerry Wagner	Fire Marshal/EM Coordinator
UNC-Chapel Hill	Ron Campbell	Emergency Management Coordinator
DURHAM COUNTY	Mark Schell	EM Coordinator/Durham CI/CO
City of Durham	Stephan Windsor	CRS Coordinator
OTHER STAKEHOLDERS		
State of North Carolina	Ryan Cox	NCEM Mitigation Planning Supervisor
PROJECT CONSULTANTS		
AECOM	Mike Robinson	Senior Mitigation Planner
	William Hague	GIS Analyst

Multi-jurisdictional Participation

The Eno-Haw Regional Hazard Mitigation Plan includes three counties and 13 incorporated municipalities. To satisfy multi-jurisdictional participation requirements, each county and its participating jurisdictions performed the following tasks:

- Participate in mitigation planning meetings and workshops;
- Complete the *Local Capability Assessment Survey*, *National Flood Insurance Program (NFIP) Survey*, and *Safe Growth Survey*;;
- Provide an update on previously adopted mitigation actions and propose new mitigation actions;
- Review drafts of the Eno-Haw Regional Hazard Mitigation Plan; and
- Adopt their updated local *Mitigation Action Plan*.

Jurisdictions that were unable to attend planning team meetings maintained active involvement through email and telephone discussions with the overall project lead (Mr. Kirby Saunders), the lead county representatives, and the project consultant (AECOM) to provide necessary data, input, and expertise.

Each jurisdiction participated in the planning process and each jurisdiction has developed and adopted a local *Mitigation Action Plan* unique to that jurisdiction which will be updated over time per the *Plan Maintenance Procedures* described in Section 8.

2.5 Meetings and Workshops

The preparation of this Plan required a series of meetings and workshops for facilitating discussion, gaining consensus, and initiating data collection efforts with local government staff, community officials, and other identified stakeholders. More importantly, the meetings and workshops prompted continuous input and feedback from relevant participants throughout the drafting stages of the Plan.

The following is a summary of the key meetings and workshops held by the HMPT during the development of the Plan. In many cases, routine discussions and additional meetings were held by local staff to accomplish planning tasks specific to their department or agency. For example, completing the *Local Capability Assessment Survey* or seeking approval of specific mitigation actions for their department or agency to undertake and include in their *Mitigation Action Plan*. Public meetings are summarized in subsection 2.6.

HMPT Meeting #1

Project Kickoff (August 11, 2014)

The Project Kickoff meeting was initiated by Kirby Saunders, Orange County Emergency Management Coordinator, and was led by Mike Robinson, CFM (AECOM Mitigation Planner). This meeting consisted of a detailed overview of the project, a review and discussion of the three previous county level mitigation plans and the Town of Chapel Hill plan, an explanation of the process to be followed for updating and integrating the content from the three previous county plans, an open discussion session, and an explanation of next steps.

The meeting began with a brief welcome and opportunity for each of the 23 attendees to introduce themselves to the group. Particular emphasis was placed on identifying what jurisdiction or organization each participant was there to represent. As part of this recognition process, a spreadsheet was passed around for representatives to designate one “Designated Local Jurisdiction Lead” to serve as a primary point of contact for each participating jurisdiction for the duration of the project.

The project overview consisted of an explanation of the purpose of the planning process and the concept of creating a regional hazard mitigation plan to build upon and essentially replace the previously adopted mitigation plans for the planning area. It also covered the geographic scope of the project, the proposed schedule for the project, and a detailed breakdown of the key project tasks. The roles and responsibilities for AECOM, Orange County as the lead local agency, and for all participating jurisdictions were also covered. These roles and responsibilities were presented as follows:

- AECOM
 - Oversee, support, and document the completion of all key project tasks
- Orange County
 - Serving as lead coordinating agency
 - Designation of local project manager
 - Assistance with the collection of documents, data, and other information
 - Logistics for project meetings
 - Hosting and managing project website
 - Responding to inquiries from the public or stakeholders
 - Coordinating with participating jurisdictions
- All participating jurisdictions
 - Designate local jurisdiction lead
 - Attend Hazard Mitigation Planning Team meetings
 - Coordination between counties, municipalities, and local stakeholders
 - Data collection and information sharing
 - Mitigation strategy development (*Mitigation Action Plans*)
 - Assist with public outreach
 - Review and comment on draft plan materials

The review of the three previous county level plans included a comparison of the hazards addressed in each previous county plan, the types of maps that were included in each of the previous county plans, and the structure and content of the mitigation strategy section in each previous county plan. Initial discussions were held to begin to decide how these items should be addressed in the new regional plan format.

A discussion was also facilitated to discuss ways that existing resources could be leveraged, such as existing plans, studies, and reports; existing data and information; local knowledge sharing; and other resources, such as the State of North Carolina iRISK program and Risk Management Tool (RMT). Five primary planning resources were also introduced to the HMPT at this time: the *Local Mitigation Planning Handbook*, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*, *Integrating Hazard Mitigation Into Local Planning*, *Plan Integration Guide*, and *Integrating Historic Property and Cultural Resource Considerations Into Hazard Mitigation Planning*, all relevant publications from FEMA providing mitigation planning guidance.

Emphasis was also placed on the need for effective communication throughout the duration of the project. This included an overview of the planning team's organization and the idea that municipal jurisdictions would coordinate first through their Designated Local Jurisdiction Lead who would in turn coordinate with the Designated Local Jurisdiction Lead for that county, who would in turn coordinate with the overall local project lead, Kirby Saunders with Orange County. Active participation and responsiveness were also stressed in light of the aggressive schedule to complete the plan in the desired timeframe.

A detailed discussion also centered on GIS data collection needs and the process to be followed for collecting and submitting the needed data (which was to follow the chain of communication described in the paragraph above). Emphasis was placed on the need for the GIS data to be submitted in a readily usable format and to be the best data readily available.

The Planning Team was also given an overview of a Public Outreach Strategy that would be developed between HMPT Meeting #1 and HMPT Meeting #2. The goals of the Public Outreach Strategy were stated as:

- Generate public interest;
- Solicit citizen input; and
- Engage additional partners in the planning process.

Specific opportunities for public participation were identified as being at least two in-person open public meetings, the creation of a public project information website, a web-based public participation survey, a project information fact sheet, and use of social media (Facebook, Twitter, RSS, and other various options).

During the open discussion session, the following talking points were covered by the group: potential opportunities in regionalizing the plans, potential obstacles or barriers, naming the regional plan, and other local issues, concerns and ideas.

Next steps were defined as assignment of Designated Local Jurisdiction Leads (to be completed as soon as possible); data collection (to be completed by September 15, 2014); finalize Public Outreach Strategy (to be completed by September 15, 2014); prepare preliminary risk assessment decisions, analysis, and map templates (to be completed by December 4, 2014); and prepare for HMPT Meeting #2 (to be held September 15, 2014).

A copy of the agenda and sign-in sheet for this meeting are included in Appendix E.

HMPC Meeting #2

Public Outreach Strategy (September 15, 2014)

The Public Outreach Strategy meeting was initiated by Kirby Saunders, Orange County Emergency Management Coordinator, and was led by Mike Robinson, CFM (AECOM Mitigation Planner). This meeting consisted of a detailed overview of the final draft Public Outreach Strategy, a hazard identification exercise, recommendations for the *Risk Assessment*, an overview of the *Local Capability Assessment Survey*, *National Flood Insurance Program (NFIP) Survey* and *Safe Growth Survey*, discussion of a regional vision statement and mitigation goals, an update on data collection progress, an open discussion session, and an explanation of next steps.

The meeting began with a brief welcome and opportunity for each of the 16 attendees to introduce themselves to the group. A printed handout containing the final draft Public Outreach Strategy was distributed to the HMPT and a review of the document was provided via PowerPoint. The strategy (found in Appendix C) follows the outline presented at the first meeting in terms of goals, outreach opportunities, etc.

Additional details were provided regarding the two proposed in-person open public meetings:

- Public meetings would be scheduled at two key points during the project timeline: following completion of the draft risk and capability assessments and following completion of the draft plan;

- The primary purpose of the meetings would be to inform the public on the process and current status of the regional planning process and to gain input to the process during the drafting stage and prior to plan completion and approval; and
- AECOM would prepare materials to help facilitate two-way communication with public meeting attendees, including comment cards, hard copies of the public participation survey, plotter-size map illustrations, and relevant video clips.

The project information fact sheet was also presented to the group and additional opportunities were discussed for disseminating the fact sheet to the public. The fact sheet contains an overview of the regional mitigation planning effort; an explanation of the planning process including the six main planning steps of public outreach, risk assessment, capability assessment, mitigation strategy development, plan maintenance, and plan adoption; project leadership; project schedule; and contact information.

Another significant topic covered at the meeting was the online public participation survey (<https://www.surveymonkey.com/s/aodhazardmitigation>).² At the time of the second meeting, screen mock-ups were shown to the group along with several sample questions. It was explained that the survey would go live around September 30, 2014 and would remain open until December 31, 2014. The survey was hosted by AECOM using the SurveyMonkey web hosting service. The primary purpose of the survey was to solicit input from any interested parties in the planning area. The survey also offered individuals that were unable to attend the in-person meetings the opportunity to participate in the planning process. Information from the online survey allows the project team to better understand the types of hazards that most concern the public and the mitigation actions that are of particular interest. The survey was made accessible through hyperlinks posted on the project information website and circulated via email, Facebook, newspaper articles, etc. Additionally, hard copies of the survey would be distributed at the first in-person public meeting on December 4, 2014. The feedback received was ultimately evaluated and incorporated into the HMPT's decision making process and the final plan.

Attendees were asked to participate in an exercise called "Mayor for the Day" in which each planning team member was given \$20 in pretend currency (divided into one \$10, one \$5, and five \$1's). Planning team members were then asked to "spend" their limited funds on mitigation actions designed to address the natural hazards of most concern to them. The natural hazards were represented by a row of cups each labeled with the name of a natural hazard likely to be addressed in the regional plan. The results of this exercise are as follows:

- Flood: \$75
- Winter Weather: \$66
- Hurricane: \$22
- Drought: \$18
- Thunderstorm: \$16
- Dam/Levee Failure: \$10
- Tornado: \$9
- Erosion: \$5

² The online survey was closed on December 31, 2014. This hyperlink is provided for documentation and reference purposes only as the link will no longer access the survey. A complete list of questions and responses can be found in Appendix D.

- Wildfire: \$1
- Earthquake: \$0
- Hail: \$0
- Landslide: \$0
- Lightning: \$0
- Nor'easter: \$0
- Other: \$0

Observations:

- Flood, winter weather, and hurricane were the top three hazards having received the most funding;
- Flood, winter weather, and hurricane were also the only hazards to receive \$10 bills, indicating a high priority;
- Drought and thunderstorm came in 4th and 5th place and are also the only hazards (other than flood and winter weather) to receive \$5 bills, indicating a secondary priority;
- Lower priority hazards would include dam/levee failure, erosion, tornado and wildfire
- Earthquake, hail, landslide, lightning, nor'easter, and other hazards could be considered negligible priorities;
- It is important to note that this exercise focused on participants' priorities based on where they would spend their limited money if they had received actual grant money to spend; it does not take into account any actual risk or vulnerability analysis. That analysis will take place over the next couple of months and will be compared to these initial perceptions.

The *Local Capability Assessment Survey* (found in Appendix G) was distributed to the HMPT and explained. Essentially, the *Local Capability Assessment Survey* is designed to capture indicators of local capability in the following categories: planning and regulatory capability, administrative and technical capability, fiscal capability, education and outreach capability, political capability, and self assessment. The Designated Local Jurisdiction Lead was given approximately two weeks to complete the survey and return it to Kirby Saunders with Orange County Emergency Management. Results of this survey are presented in the *Capability Assessment* section (Section 5) and Appendix G.

The *National Flood Insurance Program (NFIP) Survey* (also found in Appendix G) was distributed to the HMPT and explained. Basically this survey instrument is designed to assess the activities undertaken by the jurisdiction to maintain compliance in the NFIP and plans for continuing to maintain compliance in the future. Responses to this survey were used to help document each jurisdiction's participation in the NFIP per mitigation planning requirements. The Designated Local Jurisdiction Lead was given approximately two weeks to complete the survey and return it to Kirby Saunders with Orange County Emergency Management.

The *Safe Growth Survey* (found in Appendix H) was distributed to the HMPT and explained. Essentially, the *Safe Growth Survey* is designed to capture indicators of safe growth policy in the following categories: comprehensive planning (land use, transportation, environmental management, and public safety), zoning ordinances, subdivision regulations, capital improvement programming and infrastructure policies, and other indicators. The Designated Local Jurisdiction Lead was given approximately two weeks to complete the survey and return it to Kirby Saunders

with Orange County Emergency Management. Results of this survey were taken into account by members of the HMPT as they reviewed, revised, and crafted their updated *Mitigation Action Plans*.

A suggestion was made by AECOM to develop a regional vision statement to help define the new regional plan. General thoughts about a vision statement that were shared as part of the presentation included that a vision statement:

- Captures the overall purpose of the planning process;
- Expresses the outcome that the participating jurisdictions seek to accomplish as the plan is implemented;
- Helps drive the planning process;
- Unites the planning team around a common purpose;
- Provides a foundation for the rest of the planning process; and
- Communicates the reason for the plan to stakeholders, elected officials, and the public.

The draft vision statement shared with the HMPT was:

“Through a coordinated regional planning effort, create and implement an effective hazard mitigation plan that will identify and reduce risk to natural hazards in order to protect the health, safety, quality of life, environment and economy of the Alamance, Orange, Durham county area.”

The meeting ended with open discussion and a list of next steps, which consisted of the following: Next meeting: Thursday, December 4; discuss draft risk assessment results and capability assessment results; begin thinking about mitigation strategy development including finalizing the regional vision statement; developing regional mitigation goals; and reviewing existing mitigation actions and developing new ones.

HMPT Meeting #3

Mitigation Strategy Workshop (December 4, 2014)

The Mitigation Strategy Workshop was initiated by Kirby Saunders, Orange County Emergency Management Coordinator, and was led by Mike Robinson, CFM (AECOM Mitigation Planner). This meeting consisted of an overview of draft risk assessment findings and draft capability assessment results, an update on public outreach, discussion of the regional vision statement, an exercise to formulate regional mitigation goals and regional mitigation actions, and an explanation of next steps.

The meeting began with a brief welcome and opportunity for each of the 21 attendees to introduce themselves to the group. The meeting continued with an overview of the draft risk assessment findings. The hazards addressed included: riverine flood, wildfire, tropical/extratropical wind (hurricane), thunderstorm wind, winter storm, tornado, earthquake, drought, extreme heat, landslide, hail, lightning, and dam failure. For each hazard the following information was shared, as appropriate: hazard maps, tables of at-risk buildings and infrastructure, and historical hazard occurrences. Complete inventories and maps were shown for demographic data, building footprints, critical facilities, and infrastructure elements. The technical information shared during this portion of the presentation is too extensive to share in this section. Copies of the PowerPoint slides are available in Appendix E and the final results of the risk assessment are shown in the *Risk Assessment* section (Section 4).

The next portion of the presentation consisted of an overview of the draft capability assessment findings. Participation from the *Local Capability Assessment Survey* at the time of this meeting was 50%. Reminders were issued at the meeting and follow-up emails were sent out to the HMPT following the meeting. The results centered on findings in the areas of planning and regulatory capability, administrative and technical capability, fiscal capability, education and outreach capability, political capability, and a community self assessment. The point system and overall capability assessment score for the Region were presented to the group along with a ranking of local capability by jurisdiction. All of this information is presented in its final form in the *Capability Assessment* section (Section 5).

An update on the Public Participation Survey was also provided just prior to a working lunch being served. At the time of the meeting, less than 50 online surveys. Ideas for further promoting the survey were discussed and announcements were made with regard to web pages where the link to the survey had been added. A reminder was also issued that the first public meeting would be held that evening (December 4, 2014) at the Whitted Human Services Building meeting facilities where the workshop was currently being held.

An update was also given on the public project information website proposed at the first meeting. At the time of the December 4, 2014 meeting, the website was live and already contained the final project information fact sheet; contacts, task lists, meeting slides, and handouts for the planning committee; existing plan documents; planning guidance and resources; social media integration; and project contact information. The URL for the project information website is <http://www.orangecountync.gov/emergency/Eno-HawRHMP.asp>.

HMPT Meeting #4

Presentation of Draft Mitigation Plan (March 27, 2015)

The Presentation of Draft Mitigation Plan meeting was initiated by Kirby Saunders, Orange County Emergency Management Coordinator, and was led by Mike Robinson, CFM (AECOM Mitigation Planner). This meeting consisted of a high-level walkthrough of the working draft Hazard Mitigation Plan including all of its sections, instructions for the committee's review and comment period, results of the public participation survey, discussion of plan maintenance procedures, an open discussion session, and an explanation of next steps.

The portion of the presentation covering a walkthrough of the working draft plan document consisted of an overview of the plan's organization (i.e., table of contents), a brief status update on each section, an explanation of the review and comment process, suggested areas of focus for the committee members, availability of the review files on the project information website, and instructions for submitting review comments by April 10, if possible.

Some of the questions asked regarding plan maintenance procedures included the following:

- Who will be the lead agency for future mitigation planning meetings, updates, progress reports, etc.?
- What will be the schedule for any ongoing meetings of the HMPT, prior to the next 5-year plan update? (Such as annual meetings, bi-annual meetings, "as-needed" meetings, etc.)
- To what extent will you seek to integrate the regional plan with other local plans, policies and programs? (Such as comprehensive plans, land use plans, emergency operations plans, etc.)

- What other implementation strategies can you use?
- What criteria will be used for 5-year plan updates?
- What kind(s) of reporting procedures would you like to adopt?
- How will you keep the public involved?
- How will you keep stakeholders involved?

Responses and decisions based on these questions are reflected in the *Plan Maintenance Procedures* section (Section 8).

The discussion of next steps consisted of another reminder regarding the review/comment period and deadline, an explanation that the next version of the plan document would be considered a final draft based on the committee's review comments, an overview of the upcoming State and FEMA plan review process, and local adoption procedures and expectations.

2.6 Involving the Public

An important component of any mitigation planning process is public participation. Individual citizen and community-based input provides the entire planning team with a greater understanding of local concerns and increases the likelihood of successfully implementing mitigation actions by developing community “buy-in” from those directly affected by the decisions of public officials. As citizens become more involved in decisions that affect their safety, they are more likely to gain a greater appreciation of the hazards present in their community and take the steps necessary to reduce their impact. Public awareness is a key component of any community's overall mitigation strategy aimed at making a home, neighborhood, school, business, or entire planning area safer from the potential effects of hazards.

Public involvement in the development of the Eno-Haw Regional Hazard Mitigation Plan was sought using various methods including open public meetings, an interactive public information website, a project information fact sheet with contact information, a public participation survey, and by making copies of draft Plan documents available for public review on county websites and at government offices. Public meetings were held at two distinct periods during the planning process: (1) during the drafting stage of the Plan; and (2) upon completion of a final draft Plan, but prior to official plan approval and adoption. These public meetings were held at a central location to the planning area to ensure that citizens from each of the three participating counties had reasonable access to the opportunity to participate in-person in the planning process. The public participation survey (discussed in greater detail in subsection 2.6.1) was made available online via the project information website, each county's website, through web links forwarded via email and newspaper articles, Facebook, Twitter, etc., and in hardcopy form at the first public meeting.

Public Meeting #1

Public Meeting #1 was held from 6 p.m. to 8 p.m. on Thursday, December 4, 2014 at the Whitted Human Services Building meeting facilities. Four “stations” were set up for members of the public to browse through with two County staff and NCEM staff to host the stations and “float” as needed. Station #1 consisted of a sign-in sheet, print copies of the Public Participation Survey, and a comment card for members of the public to complete during their visit. Station #2 consisted of a set of full color, plotter-sized maps of the planning area showing various hazard zones for discussion. Station #3 consisted of a kiosk presenting a background video on “what is mitigation?” Station #4

consisted of a kiosk presenting a background video on flood insurance. This public meeting was attended by one member of the public.

Public Meeting #2

Public Meeting #2 was held from 6 p.m. to 8 p.m. on Thursday, April 30 at the Durham County Emergency Operations Center located at 2422 Broad Street, Durham, North Carolina. Four “stations” were set up for members of the public to browse through with planning team members to host the stations and “float” as needed. Station #1 consisted of a kiosk presenting a background video on “what is mitigation?” Station #2 consisted of a set of full color, plotter-sized maps of the planning area showing various hazard zones for discussion. Station #3 provided print copies of the draft plan and specifically the *Mitigation Strategy* section and the *Mitigation Action Plans* for each participating jurisdiction for members of the public to review and comment on. (Printed comment forms were provided for the public to leave comments on.) Station #4 consisted of a kiosk presenting a background video on flood insurance. This public meeting was attended by one member of the public. No substantial comments were received.

2.6.1 Public Participation Survey

The Eno-Haw Hazard Mitigation Public Participation Survey was made available on September 30, 2014 and remained available until December 31, 2014 per the Public Outreach Strategy. During this time, 24 surveys were completed. The complete results of the survey can be found in a summary report found in Appendix D. Charts and figures are also provided in the PowerPoint file for Meeting #4 (found in Appendix E).

The following list is a high-level summary of the dominant responses obtained from the survey.

- 87.5% said they have been personally impacted by a disaster.
- When asked which hazards they have personally been impacted by, the top three responses were severe winter storm, hurricane/tropical storm, and drought/extreme heat, in that order.
- When asked how concerned they are about the possibility of their community being impacted by natural hazards, the top three concerns were severe winter storms, severe thunderstorms, and hurricanes/tropical storms, in that order.
- When asked which category of community assets are the most *susceptible* to natural hazards, most respondents chose cultural and historic resources.
- When asked how *important* each type of community asset is to them, the top three answers were hospitals and medical care facilities, fire stations, and police stations, in that order.
- When asked which type(s) of mitigation actions are most important to them, most respondents said protecting critical facilities.
- When asked which category(ies) of mitigation techniques are most important to them, most respondents said actions relating to plans and regulations and education and awareness programs.
- 76.19% of respondents said that the best way for them to receive information related to natural hazards and hazard mitigation is via the Internet.

- 95.0% said they are interested in making their home or neighborhood more hazard resistant.
- 90.48% said their home is not located in the floodplain.
- 85.71% said they do not carry flood insurance.
- 42.86% said they have lived in the Eno-Haw area 20+ years.
- 95.24% said they own their home.
- 95.24% live in a single-family home.

The results of the survey were presented to members of the HMPT at HMPT Meeting #4 so that public opinion could be factored into final changes and additions to each jurisdiction's *Mitigation Action Plan*.

2.7 Involving Stakeholders

The Eno-Haw Hazard Mitigation Planning Team included a variety of stakeholders beyond the representatives from each participating jurisdiction. Input from additional stakeholders, including neighboring communities, was welcomed through the open public meetings and online survey. If any additional stakeholders representing other agencies and organizations participated through the Public Participation Survey, that information is unknown due to the anonymous nature of the survey.

2.8 Documentation of Plan Progress

Progress in hazard mitigation planning for the participating jurisdictions in the Eno-Haw Region is documented in this plan update. Since hazard mitigation planning efforts officially began in the participating counties with the development of the initial hazard mitigation plans in the early 2000s, many mitigation actions have been completed and implemented in the participating jurisdictions. These actions will help reduce the overall risk to natural hazards for the people and property in the Eno-Haw Region. The actions that have been completed are documented in the *Mitigation Action Plans* found in Section 7.³ In addition, community capability continues to improve with the implementation of new plans, policies, and programs that help to promote hazard mitigation at the local level. The current state of local capabilities for the participating jurisdictions is captured in Section 5: *Capability Assessment*. The participating jurisdictions continue to demonstrate their commitment to hazard mitigation and hazard mitigation planning and have proven this by reconvening the Hazard Mitigation Planning Team to update and combine the previous hazard mitigation plans into this new regional plan and by continuing to involve the public in the hazard mitigation planning process.

³ The 2010 hazard mitigation plan for Alamance County included one set of mitigation actions at the county level intended to apply to all jurisdictions countywide within the planning area. With the 2015 plan update and the understanding that each participating jurisdiction should have its own individual Mitigation Action Plan, those collective actions were assessed to determine which ones were appropriate for each jurisdiction. In the case of Alamance, Burlington, Elon, Graham, Green Level, Haw River, Mebane, Ossipee, and Swepsonville for example, not all actions “carry over” from the 2010 plan to the 2015 plan update because they were never directly relevant to the municipality. This is primarily true for “countywide” actions related to the Community Rating System (CRS), shelter agreements, and coordination with NCDOT. Ossipee is a clear example of this, as actions pertaining to the CRS for instance are not relevant because the community does not participate in the NFIP.

Section 3: Planning Area Profile

This section provides a general overview of the Eno-Haw Region which has been defined as the planning area for this Plan. It consists of the following four subsections:

- 3.1 Geography and the Environment
- 3.2 Population, Housing, and Demographics
- 3.3 Infrastructure and Land Use
- 3.4 Employment and Industry

3.1 Geography and the Environment

The Eno-Haw Region is comprised of three contiguous counties in the central region of North Carolina: Alamance County, Orange County, and Durham County. A map profiling the planning area is shown in **Figure 3.1**.

Table 3.1 shows total land and water area for the three counties and for the Eno-Haw Region as a whole.

Table 3.1: Total Land and Water Area for the Eno-Haw Region

County	Total Land Area (In Square Miles)	Total Water Area (In Square Miles)	Total Area (In Square Miles)
Alamance	430	5	435
Orange	398	3	401
Durham	290	7	297
TOTAL ENO-HAW	1,118	15	1,133

Source: U.S. Census Bureau, 2010.

Alamance County

Alamance County comprises the Burlington, NC Metropolitan Statistical Area, which is also included in the Greensboro-Winston-Salem-High Point, NC Combined Statistical Area. The 2012 estimated population of the metropolitan area was 153,920. Alamance County was named after Great Alamance Creek, site of the Battle of Alamance (May 16, 1771), a pre-Revolutionary War battle in which militia under the command of Governor William Tryon crushed the Regulator movement. Great Alamance Creek, and in turn Little Alamance Creek, according to legend, were named after a local Native American word to describe the blue mud that was found at the bottom of the creeks. Other legends say that the name came from another local Native American word meaning "noisy river," or for the Alamanni region of Rhineland, Germany, where many of the early settlers would have come from.

Orange County

Orange County is included in the Durham-Chapel Hill, NC Metropolitan Statistical Area, which is also included in the Raleigh-Durham-Chapel Hill, NC Combined Statistical Area, which had a 2012 estimated population of 1,998,808. The county was formed in 1752 from parts of Bladen County, Granville County, and Johnston County. It was named for the infant William V of Orange, whose mother Anne, daughter of King George II of Great Britain, was then regent of the Dutch Republic. In 1771, Orange County was greatly reduced in area. The western part of the county was combined with the eastern part of Rowan County to form Guilford County. Another part was combined with

parts of Cumberland County and Johnston County to form Wake County. The southern part of what remained became Chatham County. In 1777, the northern half of what was left of Orange County became Caswell County. In 1849, the western third of the still shrinking county became Alamance County. Finally, in 1881 the eastern half of the county's remaining territory was combined with part of Wake County to form Durham County. Some of the first settlers of the county were English Quakers, who settled along the Haw and Eno Rivers.

Durham County

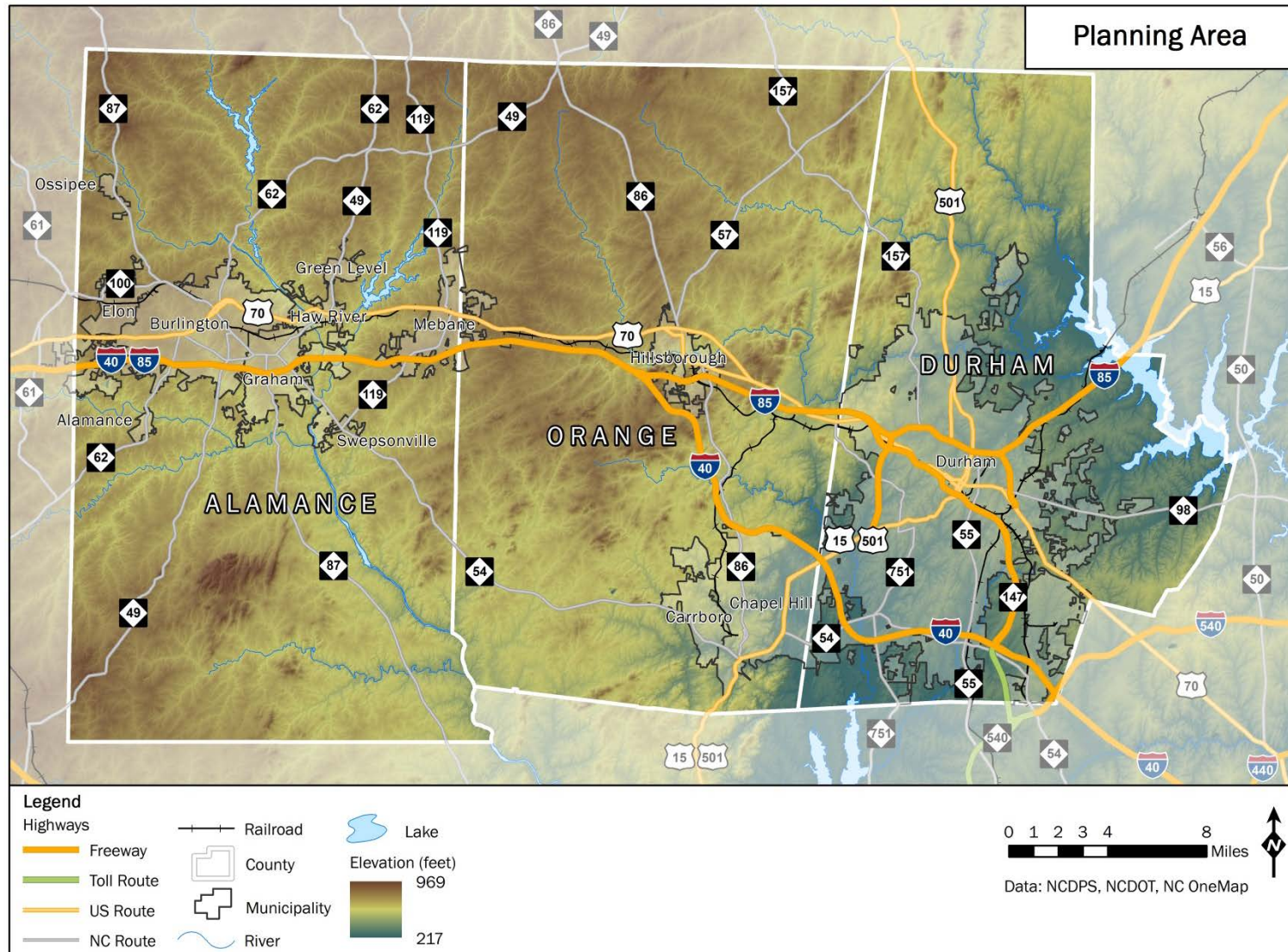
Durham County is the core of the Durham-Chapel Hill, NC Metropolitan Statistical Area, which is also included in the Raleigh-Durham-Cary, NC Combined Statistical Area, which had a population of 1,749,525 as of 2010. The county was formed on April 17, 1881 from parts of Orange County and Wake County, taking the name of its own county seat. In 1911, parts of Cedar Fork Township of Wake County was transferred to Durham County and became Carr Township. Durham County is located in the rolling Piedmont Region of North Carolina about halfway between the Blue Ridge Mountains and the beaches of the Outer Banks. Durham County has one major municipality, the City of Durham. Durham County is also home to Research Triangle Park (RTP), the largest and most successful planned research park in the United States. The park is located on 7,000 acres of North Carolina pine forest and nearly 75% of the Park's property and 95% of the corporate enterprises are located in Durham County.

Major Rivers

The Eno River, named for the Eno Indians who once lived along its banks, is the initial tributary of the Neuse River in North Carolina. The Eno River rises in Orange County and the river's watershed occupies much of Orange and Durham counties. The Eno River converges with the Flat River and the Little River to form the Neuse River at Falls Lake, which straddles Durham and Wake counties. The Eno River is notable for its beauty and water quality, which has been preserved through aggressive citizen efforts. The distances from its source to its convergence at the Neuse is approximately 40 miles, however the Eno River features significant stretches of natural preservation. Through the combined efforts of the North Carolina State Parks System, local government, and private non-profit preservation groups, over 5,600 acres of land have been protected in the Eno Basin, including Occoneechee Mountain State Natural Area, Eno River State Park, West Point on the Eno (a Durham City Park), and Penny's Bend State Nature Preserve (managed by the North Carolina Botanical Garden).

The Haw River is a tributary of the Cape Fear River, approximately 110 miles long, that is entirely contained in north central North Carolina. The Haw River rises in the Piedmont country, in northeast Forsyth County, near the border with Guilford County just north of Kernersville. The river flows northeast, passing north of Oak Ridge and Summerfield into southern Rockingham County, passing through Haw River State Park, north of Greensboro. The river then begins to flow southeast as it moves through the corner of Guilford County into Alamance County. In Alamance County, the Haw River flows through Ossipee and passes north of Burlington, and through the unincorporated community of Carolina. It goes through the town of Haw River. It flows south and is joined by Great Alamance Creek at Swepsonville and continues on to Saxapahaw. The river forms the southeast border of Alamance County, a border shared by Orange County and Chatham County. The course of the Haw River continues southeast in Chatham County as it flows just north of Pittsboro. Approximately 12 miles southeast of the tip of Alamance County, the Haw River flows into the Jordan Lake reservoir, which is formed by the confluence of the Haw River and New Hope Creek. Four miles south of Jordan Lake dam, the Haw River joins the Deep River to form the Cape Fear River.

Figure 3.1: Planning Area Profile Map



3.2 Population, Housing, and Demographics

A summary of population, housing, and demographic data for each of the participating counties is presented in **Table 3.2** based on data derived from the U.S. Census Bureau, along with totals and averages for the Eno-Haw Region.

Table 3.2: Demographic Data for the Eno-Haw Region

Summary of Population, Housing, and Demographics				
Value	Alamance	Orange	Durham	Eno-Haw
Population, 2013 estimate	154,378	140,352	288,133	582,863
Population, 2011 MSA totals	153,291	512,979	512,979	N/A
Population, 2010 (April 1) estimates base	151,219	133,724	269,974	554,917
Population, percent change, April 1, 2010 to July 1, 2013	2.1%	5.0%	6.7%	4.6%
Population, 2010	151,131	133,724	267,587	552,442
Persons under 5 years, percent, 2013	5.8%	4.8%	7.2%	5.9%
Persons under 18 years, percent, 2013	22.9%	20.5%	22.1%	21.8%
Persons 65 years and over, percent, 2013	15.7%	10.8%	10.6%	12.4%
Living in same house 1 year & over, percent, 2008-2012	85.3%	76.1%	76.5%	79.3%
Language other than English spoken at home, 2008-2012	11.6%	15.9%	19.5%	15.7%
Mean travel time to work (minutes), 2008-2012	23	22.1	21.4	22.2
Housing units, 2013	67,473	56,093	125,001	248,567
Homeownership rate, 2008-2012	67.5%	60.0%	55.0%	60.8%
Median value of owner-occupied housing units, 2008-2012	\$136,500	\$272,900	\$179,800	\$196,400
Households, 2008-2012	60,310	51,163	109,109	220,582
Persons per household, 2008-2012	2.44	2.42	2.34	2.40
Per capita money income in past 12 months (2012 dollars), 2008-2012	\$23,517	\$34,031	\$28,634	\$28,727
Median household income, 2008-2012	\$44,155	\$55,241	\$50,997	\$50,131
Persons below poverty level, percent, 2008-2012	17.3%	17.4%	18.0%	17.6%
Retail sales, 2007 (\$1000)	\$1,968,813	\$1,195,285	\$3,135,341	\$6,299,439
Retail sales per capita, 2007	\$13,595	\$9,583	\$12,257	\$11,812
Building permits, 2012	358	232	2,666	3,256
Land area in square miles, 2010	430	398	290	1,118
Persons per square mile, 2010	356.5	336.2	935.7	542.8

Source: U.S. Census Bureau.

3.2.1 Population

Durham County has the largest population among the three Eno-Haw counties with a total population of 288,133 according to 2013 estimates from the U.S. Census Bureau. This represents nearly half of the population of the Eno-Haw Region as a whole. The average growth rate in the Eno-Haw Region is 4.6% based on a comparison of 2010 census counts and 2013 estimates. The largest percent change among the three counties was in Durham County (6.7%) and the least amount of change was in Alamance County (2.1%). Population densities across the planning area are shown in **Figure 3.2**.

3.2.2 Housing

Durham County has 125,001 housing units according to 2013 census estimates, which represents approximately 50% of the housing stock in the Eno-Haw Region. Alamance County contains 67,473 housing units (27%), and Orange County contains 56,093 (23%). The average number of persons per household in the region is 2.4.

3.2.3 Demographics

Table 3.3 provides a detailed breakdown of additional demographic data for the planning area according to the U.S. Census Bureau.

Table 3.3: Demographic Data for the Eno-Haw Region

Summary of Demographic Data (Based on 2013 Estimates)				
Value	Alamance	Orange	Durham	Eno-Haw
White alone	75.8%	77.0%	53.1%	68.6%
Black or African American alone	19.3%	12.2%	38.7%	23.4%
American Indian and Alaska Native alone	1.4%	0.6%	1.0%	1.0%
Asian alone	1.5%	7.6%	4.8%	13.9%
Native Hawaiian and Other Pacific Islander	0.1%	0.1%	0.1%	0.1%
Two or More Races	1.9%	2.5%	2.3%	2.2%
Hispanic or Latino	11.8%	8.3%	13.5%	33.6%
White alone, not Hispanic or Latino	66.2%	70.0%	42.1%	59.4%

Source: U.S. Census Bureau.

3.3 Infrastructure and Land Use

3.3.1 Infrastructure

Alamance County

Major highways located in Alamance County include: I-40/I-85, US 70, NC 49, NC 54, NC 62, NC 87, NC 100, and NC 119. The economy in Alamance County was influenced, in its early history, from its location on the river and railroad, its modern life and economic history are influenced by its location on Interstates and near airports. Alamance County is located in north-central North Carolina halfway between (and under an hour from) two larger metro regions—the famed Research Triangle (Raleigh-Durham-Chapel Hill) to the east and the Piedmont Triad (Greensboro-High Point-Winston-Salem) to the west. Alamance County is connected to both regions by two Interstates, I-85 and I-40, which run concurrently through the county. Each metro also has a major commercial airport connecting Alamance County to the nation and the world with over 100 flights daily.

Given this proximity and connectivity to modern Interstates and airports, Amtrak operates a daily train between Charlotte and New York City (the Carolinian) which stops at the Depot in the City of Burlington. The State of North Carolina, in cooperation with Amtrak, operates two additional daily trains between Raleigh and Charlotte which also stop in Burlington. National bus service is provided by Greyhound and Megabus with stops at designated stops in Alamance County. City of Burlington is working to provide a municipal bus service for the citizens of Burlington with designated stops in portions of the county. Triangle Transit Authority and Piedmont Area Regional Transportation began operating a weekday bus service in the Town of Mebane on Monday, with a stop at the park-and-ride lot at Alamance Regional Medical Center’s MedCenter Mebane location, 3940 Arrowhead Blvd., and at City Hall, 106 E. Washington Street. The City of Graham is also served by Triangle Transit Authority and Piedmont Area Regional Transportation which also operates weekday service to citizens of Graham with transportation to Chapel Hill and Greensboro areas.

Orange County

Orange County’s transportation network is comprised of a hierarchy of roads that moves automobiles and provides access to land developments, railroad lines that allow freight and commuter trains to move through the county, bicycle routes that provide access to points of interest and recreational trails, and local sidewalks and pedestrian facilities that foster walking in neighborhoods, downtowns, and at commercial and employment centers. Major highways located in Orange County include: I-40, I-85, US 15, US 70, US 501, NC 49, NC 54, NC 57, NC 86, and NC 751. An estimated 68% of commuters use a car, truck, or van to get to work, with an estimated 9.5% using a carpool.

The University of North Carolina at Chapel Hill owns and operates Horace Williams Airport, a small public use facility. In 2007, the airport had 10,800 aircraft operations with an average of 29 per day: 94% general aviation, 5% air taxi, and 1% military.

GoTriangle (formerly known as Triangle Transit Authority) provides regional bus service linking the Town of Chapel Hill to Research Triangle Park, Raleigh-Durham International Airport, Duke University, NC State University, and other key regional locations. GoTriangle also contracts with Orange Public Transportation (OPT) to provide service between the Towns of Hillsborough and Chapel Hill. In addition, GoTriangle has a vanpool program for commuters that have a greater than 20-mile round-trip.

The Towns of Chapel Hill and Carrboro, and the University of North Carolina-Chapel Hill, partner to provide daily fare-free bus service to routes in Chapel Hill and Carrboro through Chapel Hill Transit. Services include fixed route bus service, park and ride shuttle service for special events, shared ride feeder service to areas which do not receive regular bus service, and EZ rider service for individuals with mobility limitations. Many of the bus stops are shared with GoTriangle and provide access to the larger regional bus system.

Orange Public Transportation (OPT) operates fixed-route, demand-response, contract, and subscription bus services throughout Orange County, for both general public and human service transportation needs. OPT operates under the unofficial name “Orange Bus.” Orange Public Transportation’s (OPT’s) service area generally involves all areas of the county excluding the Chapel Hill Transit service area. During 2015, OPT will begin providing additional fixed-route and deviated fixed route services as part of the County’s Bus and Rail Investment Plan (2012) implementation.

Amtrak passenger service traverses central Orange County through the Town of Hillsborough, but currently does not stop in Orange County. There is widespread community support for a passenger train stop in Orange County. All local county jurisdictions, in early 2008, indicated their support for a train station to be located in Hillsborough and the Town of Hillsborough requested North Carolina Department of Transportation Rail Division, North Carolina Railroad, and the National Railroad Passenger Corporation (Amtrak) to consider adding a stop in Hillsborough.

Durham County

Major highways located in Durham County include: I-40, I-85, I-540/NC 540, US 15, US 70, US 501, NC 54, NC 55, NC 98, NC 147, NC 157, and NC 751.

Most travel in Durham County is by private vehicle on the county’s network of public streets and highways. Important arteries for traffic include NC 147, which connects Duke University, downtown, and Research Triangle Park (RTP), U.S. 15-501 between Durham and Chapel Hill, I-85, connecting Durham to Virginia and western North Carolina cities, and I-40 running across southern Durham County between RTP and Chapel Hill. The I-40 corridor has been the main site of commercial and residential development in Durham since its opening in the early 1990s. An estimated 95% of commuters use a car to get to work, with an estimated 14% of those people in carpools.

The City of Durham maintains an extensive network of bicycle routes and trails and has been recognized with a Bicycle Friendly Community Award. The American Tobacco Trail begins in downtown and continues south through RTP and ends in Wake County.

Air travel is serviced by Raleigh-Durham International Airport (RDU), 12 miles southeast of Durham, which enplanes an estimated 4.5 million passengers per year. Frequent service (5 flights a day or more) is available to Philadelphia, Atlanta, New York LaGuardia, New York Kennedy, Newark, Washington Reagan, Washington Dulles, Chicago O’Hare, Dallas, Houston, Miami, and Charlotte. Non-stop daily service is provided to approximately 30 destinations in the United States and daily international service is also available to London Heathrow and Toronto-Pearson.

Amtrak operates a daily train between Charlotte and New York City (the Carolinian) which stops at the Durham Transit Station in downtown Durham. The State of North Carolina, in cooperation with Amtrak, operates two additional daily trains between Raleigh and Charlotte which also stop in

Durham. National bus service is provided by Greyhound and Megabus at the Durham Transit Station in downtown Durham. GoDurham (formerly known as the Durham Area Transit Authority [DATA]) provides municipal bus service.

GoTriangle (formerly known as Triangle Transit Authority) offers scheduled, fixed-route regional and commuter bus service between Raleigh and the region's other principal cities of Durham, Cary, and Chapel Hill, as well as to and from RDU, RTP, and several of the region's larger suburban communities. TT also coordinates an extensive vanpool and rideshare program that serves the region's larger employers and commute destinations.

Duke University also maintains its own transit system, Duke Transit, which operates more than 30 buses with routes throughout the campus and health system.

3.3.2 Land Use

Alamance County

The Alamance County Planning Department oversees a number of community activities and the enforcement of many County regulations including: Subdivision Administration, Historic Properties, Comprehensive Planning, Water and Sewer Projects, Community Development, E-911 Addressing, Watershed Protection, and all matters relating to land development in rural Alamance County.

Orange County

The Orange County Comprehensive Plan is an official public document that provides the framework for long range decision making in the community. The Plan serves to guide the County's growth and development through the year 2030 by addressing the multitude of issues facing the county. The Comprehensive Plan includes components related to hazard mitigation including land use, environmental protection, and public safety. In addition, the adopted Plan serves as the statutory basis for many of Orange County's land use regulations, as well as the application of zoning districts. The Orange County Comprehensive Plan can be found at:

http://www.co.orange.nc.us/planning/compre_cpupdate.asp

The Orange County Unified Development Ordinance provides regulations to encourage compatible development within the county in a manner which will promote the health, safety, and general welfare of Orange County and its residents. Regulations contained in the Unified Development Ordinance strive to prevent and mitigate negative impacts from natural hazards throughout the county. The Orange County Unified Development Ordinance can be found at:

<http://www.co.orange.nc.us/planning/Ordinances.asp>

Durham County

The Comprehensive Plan is Durham's statement of how the community desires to grow and develop. The Plan guides where and how private development should occur. It guides how the City and County should provide public facilities and services to support future growth. The Plan is long range in scope, focusing on the ultimate needs of the community rather than the pressing concerns of today. Chapter 2 of the Comprehensive Plan (the Land Use Element) is available along with the complete Comprehensive Plan and maps on the City's website at:

<http://www.durhamnc.gov/departments/planning/>.

3.4 Employment and Industry

Alamance County

Alamance County can be described as a "bedroom" community, with many residents living in the county and working elsewhere due to low tax rates, although the county is still a major force in the textile and manufacturing industries. The top employers in Alamance County are:

- Laboratory Corp of America, Burlington (3,200 employees)
- Alamance-Burlington School System, Burlington (3,329 employees)
- Alamance Regional Medical Center, Burlington (2,240 employees)
- Elon University, Elon Main Campus (1,403 employees)
- Walmart Stores, Inc. (3 Locations) (1,000 employees)
- Alamance County Government (956 employees)
- City of Burlington (806 employees)
- Alamance Community College (652 employees)
- Honda Power Equipment Manufacturing (600 employees)
- GKN Driveline North America Mebane Branch (500 employees)
- Glen Raven, Inc., Altamahaw Branch (500 employees)

Orange County

Orange County has a diverse workforce ranging from dairy farmers and professors; small business people and corporate executives; developers and horse breeders; carpenters and students; medical professionals and allied health providers. The top employers in Orange County are:

- UNC Chapel Hill (1,000+ employees)
- UNC Health Care System (1,000+ employees)
- Chapel Hill – Carrboro City Schools (1,000+ employees)
- Orange County Schools (1,000+ employees)
- Orange County (Government) (1,000+ employees)
- Eurosport (500-999 employees)
- Town of Chapel Hill, Inc (500-999 employees)
- UNC Physicians Network, LLC (500-999 employees)
- Aramark Food and Support Services (500-999 employees)
- Wal-Mart Associates, Inc. (250-499 employees)
- Harris Teeter (250-499 employees)
- A K G of America, Inc. (250-499 employees)
- General Electric Corp. (250-499 employees)

Durham County

Duke University and Duke University Health System are Durham's largest employers. The top employers in Durham County are:

- Duke University and Duke University Health System (34,863 employees)
- IBM (10,000 employees)
- Durham Public Schools (4,600 employees)
- GlaxoSmithKline (3,700 employees)
- Blue Cross & Blue Shield of NC (3,200 employees)
- City of Durham (2,437 employees)
- Fidelity Investments (2,400 employees)
- Quintiles (2,400 employees)
- RTI International (2,300 employees)
- Durham VA Medical Center (2,162 employees)
- Cree (2,125 employees)
- AW North Carolina (2,000 employees)

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Section 4: Risk Assessment

This section comprises the risk assessment portion of the Eno-Haw Regional Hazard Mitigation Plan, including identification of hazards, hazard profiling and analysis, and assessment of vulnerability. It consists of the following six subsections:

- 4.1 Overview
- 4.2 Hazard Selection
- 4.3 Methodologies and Assumptions
- 4.4 Inventory of Community Assets
- 4.5 Hazard Profiles, Analysis, and Vulnerability
- 4.6 Conclusions on Hazard Risk

4.1 Overview

A risk assessment is performed as an important step toward determining the potential impacts of natural hazards on the people, built and natural environments, and economy of a given planning area. The *Risk Assessment* provides the foundation for the rest of the mitigation planning process, which is focused on identifying and prioritizing actions to reduce risk to hazards. In addition to informing the *Mitigation Strategy*, the *Risk Assessment* can also be used to establish emergency preparedness and response priorities, for land use and comprehensive planning, and for decision making by elected officials, city and county departments, businesses, and organizations in the community.

A typical risk assessment consists of three primary components. Some form of hazard identification process needs to take place, followed by detailed hazard profiles of the hazards that will be addressed in the plan. Then the profiled hazards are assessed to determine the vulnerability of the assets within the planning area to each hazard being addressed. It is also important to document key details regarding the methodologies and assumptions used to perform the risk assessment, the asset inventories used to perform the risk assessment, and finally conclusions on hazard risk. The conclusions on hazard risk essentially consist of a prioritized ranking of hazards of concern.

4.2 Hazard Selection

The Eno-Haw Region is vulnerable to a wide range of natural hazards that threaten life and property. Current regulations and interim guidance under the Disaster Mitigation Act of 2000 (DMA 2000) require, at a minimum, an evaluation of a full range of natural hazards.¹

Upon a thorough review of the full range of natural hazards covered in the existing mitigation plans for the three participating counties in the Eno-Haw area, the hazards suggested under FEMA mitigation planning guidance, and the hazards addressed in the North Carolina State Hazard Mitigation Plan, the participating jurisdictions in the Eno-Haw Region identified 12 hazards that are to be addressed in the Eno-Haw Regional Hazard Mitigation Plan. These hazards were identified

¹ An evaluation of human-caused hazards (e.g., technological hazards, terrorism, etc.) is permitted, though not required, for plan approval. The Eno-Haw Region has chosen to focus solely on natural hazards for the purposes of this plan, except where technological hazards directly relate to a natural hazard (for example, a hazardous materials facility located in a mapped floodplain).

through an extensive process that included input from Eno-Haw Hazard Mitigation Planning Team (HMPT) members.

Table 4.1 lists the full range of natural hazards initially considered for inclusion in the Plan. This table includes a total of 16 individual hazards and documents the evaluation process used for determining which of the initially identified hazards were considered significant enough for further evaluation in the *Risk Assessment*. For each hazard considered, the table indicates whether or not the hazard was identified as a significant hazard to be assessed further, how this determination was made, and why this determination was made. The table works to summarize not only those hazards that were identified (and why) but also those that were not identified (and why not).

Table 4.1: Documentation of the Hazard Selection Process

Natural Hazard Considered	Was this hazard considered significant/appropriate enough to be addressed in the plan at this time?	How was this determination made?	Why was this determination made?
ATMOSPHERIC HAZARDS			
Hail	Yes, grouped with the thunderstorm hazard.	By consensus of the Eno-Haw HMPT.	The threat of property damage from hail is of sufficient concern to warrant study.
Hurricane/Tropical Storm	Yes	By consensus of the Eno-Haw HMPT.	Despite the inland location of the planning area, hurricanes and tropical storms are of sufficient concern to warrant study.
Lightning	Yes, grouped with the thunderstorm hazard.	By consensus of the Eno-Haw HMPT.	The threat of property damage or loss of life from lightning is of sufficient concern to warrant study.
Nor'easter	No	By consensus of the Eno-Haw HMPT.	No nor'easters are known to have significantly impacted the planning area in recent history.
Thunderstorm	Yes	By consensus of the Eno-Haw HMPT.	The threat of damage from thunderstorms is of sufficient concern to warrant study.
Tornado	Yes	By consensus of the Eno-Haw HMPT.	The threat of damage and loss of life from tornadoes is of sufficient concern to warrant study.
Winter Weather	Yes	By consensus of the Eno-Haw HMPT.	The threat of damage and loss of life from winter weather is of sufficient concern to warrant study.
HYDROLOGIC HAZARDS			
Dam/Levee Failure	Yes	By consensus of the Eno-Haw HMPT.	The threat of damage and loss of life from the failure of a dam or levee is of sufficient concern to warrant study.

Natural Hazard Considered	Was this hazard considered significant/appropriate enough to be addressed in the plan at this time?	How was this determination made?	Why was this determination made?
Drought/Extreme Heat	Yes	By consensus of the Eno-Haw HMPT.	The threat of damage and loss of life from the drought and extreme heat hazard is of sufficient concern to warrant study.
Erosion	No	By consensus of the Eno-Haw HMPT.	The threat of damage from erosion is not of sufficient concern to warrant study.
Flood	Yes	By consensus of the Eno-Haw HMPT.	The threat of damage and loss of life from flooding is of sufficient concern to warrant study.
GEOLOGIC HAZARDS			
Earthquake	Yes	By consensus of the Eno-Haw HMPT.	Even though the threat of damaging earthquake activity in the planning area is relatively low, the threat of damage and loss of life from earthquakes within the state is of sufficient enough concern to warrant study.
Landslide	Yes	By consensus of the Eno-Haw HMPT.	The threat of damage and loss of life from landslides is of sufficient concern to warrant study.
Sinkholes	No	By consensus of the Eno-Haw HMPT.	Due to a lack of local concerns and recent occurrences, coupled with a lack of useable data.
OTHER HAZARDS			
Climate Change	Yes	By consensus of the Eno-Haw HMPT.	The HMPT feels that it is necessary to address changes in the climate and the effects those changes may have on identified natural hazards.
Wildfire	Yes	By consensus of the Eno-Haw HMPT.	The threat of damage and loss of life from wildfires is of sufficient concern to warrant study.

The final list of hazards to be presented in the Plan, as agreed upon by the HMPT, is as follows:

Hydrologic Hazards (Water Hazards)

- Flood
- Dam/Levee Failure
- Drought/Extreme Heat

Atmospheric Hazards (Severe Storms)

- Thunderstorm, Lightning, and Hail
- Tornado
- Winter Weather
- Hurricane and Tropical Storm

Geologic Hazards

- Landslide
- Earthquake

Other Hazards

- Wildfire

This list is repeated at the beginning of subsection 4.5.

Another consideration in the selection of the hazards to be addressed in the Plan is the history of major disaster declarations in the planning area. According to the FEMA Disaster Declarations web page, there have been 43 major disaster declarations issued in the state of North Carolina since 1954. Twelve of these declarations involved one or more of the counties included in the planning area (**Table 4.2**).

Table 4.2: Major Disaster Declarations for Alamance, Orange, and Durham Counties from 1954 to 2014

Declaration Number	Date	Incident Description	County(s) in the Planning Area Declared
4167	3/31/2014	Severe Winter Storm	Alamance, Orange
1969	4/19/2011	Severe Storms, Tornadoes, and Flooding	Alamance
1553	9/18/2004	Hurricane Ivan	Alamance
1490	9/18/2003	Hurricane Isabel	Durham
1457	3/27/2003	Ice Storm	Alamance, Orange
1448	12/12/2002	Severe Ice Storm	Alamance, Orange, Durham
1312	1/31/2000	Winter Storm	Alamance, Orange, Durham
1292	9/16/1999	Hurricanes Floyd and Irene	Alamance, Orange, Durham
1211	3/22/1998	Severe Storms, Tornadoes, and Flooding	Durham
1134	9/6/1996	Hurricane Fran	Alamance, Orange, Durham
1087	1/13/1996	Blizzard	Alamance, Orange, Durham
827	5/17/1989	Tornadoes	Durham

Source: Federal Emergency Management Agency.

As shown in Table 4.2, the earliest major disaster declaration to occur in the planning area was in 1989. The last was in 2014. The 12 major disaster declarations shown above cover the hazards of flood, hurricane/tropical storm, severe storms, severe winter weather, and tornado relevant to the

planning area. This history of disaster declarations is consistent with the hazards identified by the HMPT to be addressed in the Plan.

4.2 Methodologies and Assumptions

Certain assumptions are inherent in any risk assessment. For the Eno-Haw Regional Hazard Mitigation Plan, three primary assumptions were discussed by the HMPT from the beginning of the risk assessment process: (1) that the best readily available data would be used, including, to the extent possible, data derived from the North Carolina iRISK program, (2) that the hazard data selected for use is reasonably accurate for mitigation planning purposes, and (3) that the risk assessment will be regional in nature with local, municipal-level information and results provided where appropriate and practical.

The following list provides key points by hazard that are relevant to understanding the risk assessment presented in this section:

Flood

- Effective FEMA DFIRM data was used for the flood hazard areas. Flood zones used in the analysis consist of Zone AE (1-percent-annual-chance flood), Zone AE Floodway, and the 0.2-percent-annual-chance flood hazard area.
- Parcels were received from all three participating counties. The parcel data provided building value and year built. Building value was used to determine the value of buildings at risk. Year built was used to determine if the building was constructed prior to or after the community had joined the NFIP and had an effective FIRM and building codes enforced.
- Census blocks and Summary File 1 from the 2010 Census were used to determine population at risk. This included the total population, as well as the vulnerable elderly and children age groups. To determine population at risk, the census blocks were intersected with the hazard area. To better determine the actual number of people at risk, the intersecting area of the census block was calculated and divided by the total area of the census block to determine a ratio of area at risk. This ratio was applied to the population of the census block. For example, a census block has a population of 400 people. Five percent of the census block intersects the 1-percent-annual-chance flood hazard area. The ratio estimates that 20 people are then at risk within the 1-percent-annual-chance flood hazard area (5% of the total population for that census block).
- Limitations: There can be multiple buildings located on one parcel. However, the parcel only provides one value for building value and year built, and it is not known from the provided data if the building value is cumulative or for the primary structure on the parcel. For the analysis, building value was only counted once per parcel, regardless of the number of structures. This was done to prevent grossly over-estimating the value of buildings at risk. For example, a parcel has three buildings with a value of \$300,000. If two of those buildings intersect the 1-percent-annual-chance flood hazard area, the assumed building value at risk is \$300,000 not \$600,000. Even though only two out of three buildings are at risk, there is no way to determine the individual value of each building, so the building value for the whole parcel is counted. The value at risk is also the value of the entire building, and does not take into account flood damage based on elevation, number of floors, or value of contents.

Dam Failure

- The approximate extent of the dam failure hazard was identified by developing a potential inundation zone for 18 dams selected for study. This consists of 14 high hazard and 4 intermediate hazard dams. This breaks down to 28% of high hazard dams and 11% of intermediate hazard dams in the planning area studied. A combination of factors led to the selection of these 18 dams for study, including availability of detailed flood models, hazard classification, location in the planning area, etc.
- The potential inundation zone was developed by estimating the initial maximum depth of flooding just downstream of the dam and by then estimating the rate at which the flood depth will decrease with increasing distance downstream. Empirical formulas were used to estimate the initial maximum depth of flood as a function of the height of water impounded by the dam and the rate of decrease of the height of flooding downstream as a function of downstream distance, measured from the dam along the stream centerline.
- The estimated flood depths were then used to develop a water surface profile along the stream centerline. This water surface profile was converted to a planar surface which was intersected with a digital terrain model that represents the topography of the stream corridor and floodplain. This intersection yields a map of the approximate inundation zone that would result from a dam failure.

Lightning

- Based on NCDC data, the number of cloud-to-ground lightning flashes was calculated for each day, month, and year as well as for the 1987-to-present period of record. Additionally, the number of flashes was calculated for each hour and summarized by month, year, and period of record. Grids were created to show only positive polarity flashes for all time periods. The summary grids are defined as a 4 km Albers Equal Area grid, fit to the continental United States. The data was re-sampled to 150-meter cells using bilinear interpolation (for cartographic purposes).
- Average annual lightning strikes are the 25-year-average of annual average lightning strikes from 1987-2012. Accuracy depends on the distribution of lightning detection sensors which is unknown.

Winter Weather

- Winter storm maps are an interpolation of recorded values (historical maximums and 30-year-average) derived from individual point locations.

Wildfire

- Wildfire hazard areas were determined using the Wildland Fire Susceptibility Index (WFSI).
 - Areas with a WFSI value of 0.01 – 0.05 were considered to be at moderate risk.
 - Areas with a WFSI value greater than 0.05 were considered to be at high risk.
 - Areas with a WFSI value less than 0.01 were considered to not be at risk.
- The WFSI data used for the wildfire risk analysis is a value between 0 and 1. It was developed consistent with the mathematical calculation process for determining the probability of an acre burning. The WFSI integrates the probability of an acre igniting and the expected final fire size based on the rate of spread in four weather percentile categories into a single measure of wildland fire susceptibility. Due to some necessary assumptions, mainly fuel homogeneity, it is not the true probability. But since all areas of the state have this value determined consistently, it allows for comparison and ordination of areas of the state as to the likelihood of an acre burning.

- Parcels were received from all four participating counties. This data provided building value and year built. Building value was used to determine the value of buildings at risk.
- Census blocks and Summary File 1 from the 2010 Census were used to determine population at risk. This included the total population, as well as the vulnerable elderly and children age groups. To determine population at risk, the census blocks were intersected with the hazard area. To better determine the actual number of people at risk, the intersecting area of the census block was calculated and divided by the total area of the census block to determine a ratio of area at risk. This ratio was applied to the population of the census block. For example, a census block has a population of 400 people. Five percent of the census block intersects a high wildfire hazard area. The ratio estimates that 20 people are at risk within that hazard area (5% of the total population for that census block).
- There can be multiple buildings on one parcel. However, the parcel only provides one value for building value and year built, and it is not known from the provided data if the building value is cumulative or for the primary structure on the parcel. For the analysis, building value was only counted once per parcel, regardless of the number of structures. This was done to prevent grossly over-estimating the value of buildings at risk. For example, a parcel has three buildings with a value of \$300,000. If two of those buildings intersect the high risk area, the assumed building value at risk is \$300,000 not \$600,000. Even though only two out of three buildings are at risk, there is no way to determine the individual value of each building, so the building value for the whole parcel is counted. The value at risk is also the value of the entire building, and does not take into account the value of contents.

4.4 Inventory of Community Assets

Each participating jurisdiction assisted in the identification of assets to be used for analysis to determine what assets may be potentially at risk to the hazards covered in the Plan. These assets are defined broadly as anything that is important to the function and character of the community. For the purposes of this *Risk Assessment*, the individual types of assets include:

- Population
- Parcels and Buildings
- Critical Facilities
- Infrastructure
- High Potential Loss Properties (assessed value greater than \$1 million)
- Historic Properties

Although all assets may be affected by certain hazards (such as hail or tornadoes), some assets are more vulnerable because of their location (e.g., the floodplain), certain physical characteristics (e.g., slab-on-grade construction), or socioeconomic uses (e.g., major employers). The following subsections document the numbers and values used for the *Risk Assessment*.

4.4.1 Population

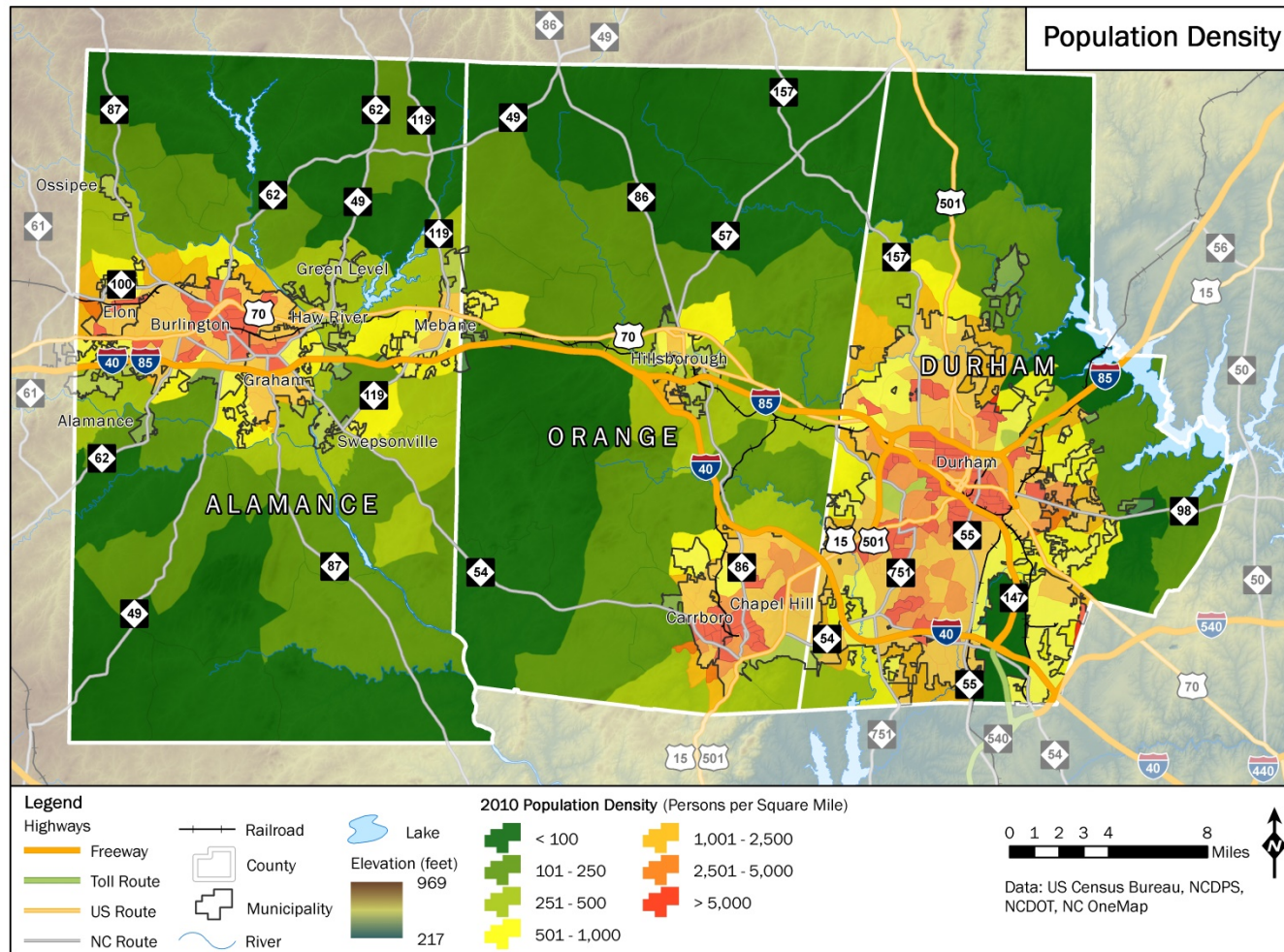
The population counts shown in **Table 4.3** are derived from 2010 census data and include a breakdown of two subpopulations assumed to be at greater risk to natural hazards than the “general” population: elderly (ages 65 and older) and children (under the age of 5). **Figure 4.1** shows population density per square mile, along with the distribution of potentially at-risk populations, across the planning area.

Table 4.3: Population Counts with Vulnerable Population Breakdown

Jurisdiction	2010 Census Population	Elderly (Age 65 and Over)	Children (Age 5 and Under)
Alamance County (Unincorporated Area)	59,157	8,404	3,351
Alamance	951	119	64
Burlington	49,963	7,863	3,541
Elon	9,419	1,543	192
Graham	14,153	2,071	1,051
Green Level	2,100	257	184
Haw River	2,298	337	189
Mebane	11,393	1,231	875
Ossipee	543	70	26
Swepsonville	1,154	186	51
<i>Subtotal Alamance</i>	<i>151,131</i>	<i>22,081</i>	<i>9,524</i>
Orange County (Unincorporated Area)	50,899	5,838	2,921
Carrboro	19,582	1,029	1,134
Chapel Hill	57,233	5,281	2,391
Hillsborough	6,087	741	444
<i>Subtotal Orange</i>	<i>133,801</i>	<i>12,889</i>	<i>6,890</i>
Durham County (Unincorporated Area)	39,257	5,971	2,232
Durham	228,330	20,146	17,583
<i>Subtotal Durham</i>	<i>267,587</i>	<i>26,117</i>	<i>19,815</i>
TOTAL ENO-HAW	552,519	61,087	36,229

Source: U.S. Census Bureau.

Figure 4.1: Population Density in the Eno-Haw Region



4.4.2 Building Counts and Values

The building counts and building values shown in **Table 4.4** represent the built environment inventories used for the analyses included in the *Risk Assessment*.

Table 4.4: Building Counts and Values by Jurisdiction

Jurisdiction	Building Count	Building Value
Alamance County (Unincorporated Area)	43,080	\$5,586,400,446
Alamance	495	\$73,196,526
Burlington	24,549	\$5,063,017,835
Elon	2,502	\$691,238,509
Graham	6,553	\$1,171,777,377
Green Level	1,010	\$77,017,878
Haw River	1,505	\$271,031,840
Mebane	4,040	\$970,860,836
Ossipee	354	\$139,783,779
Sweepsonville	658	\$111,000,138
<i>Subtotal Alamance</i>	<i>84,746</i>	<i>\$14,155,325,164</i>
Orange County (Unincorporated Area)	28,936	\$3,877,609,317
Carrboro	5,354	\$1,303,094,105
Chapel Hill	14,372	\$5,059,801,377
Hillsborough	2,835	\$504,852,574
<i>Subtotal Orange</i>	<i>51,497</i>	<i>\$10,745,357,373</i>
Durham County (Unincorporated Area)	24,667	\$3,735,835,447
Durham	79,277	\$18,116,234,138
<i>Subtotal Durham</i>	<i>103,944</i>	<i>\$21,852,069,585</i>
TOTAL ENO-HAW	240,187	\$46,752,752,122

Source: NC iRISK.

4.4.3 Critical Facilities

Table 4.5 shows counts of critical facilities under a variety of categories attributed to each participating jurisdiction. **Figure 4.2** shows the general locations of critical facilities across the planning area.

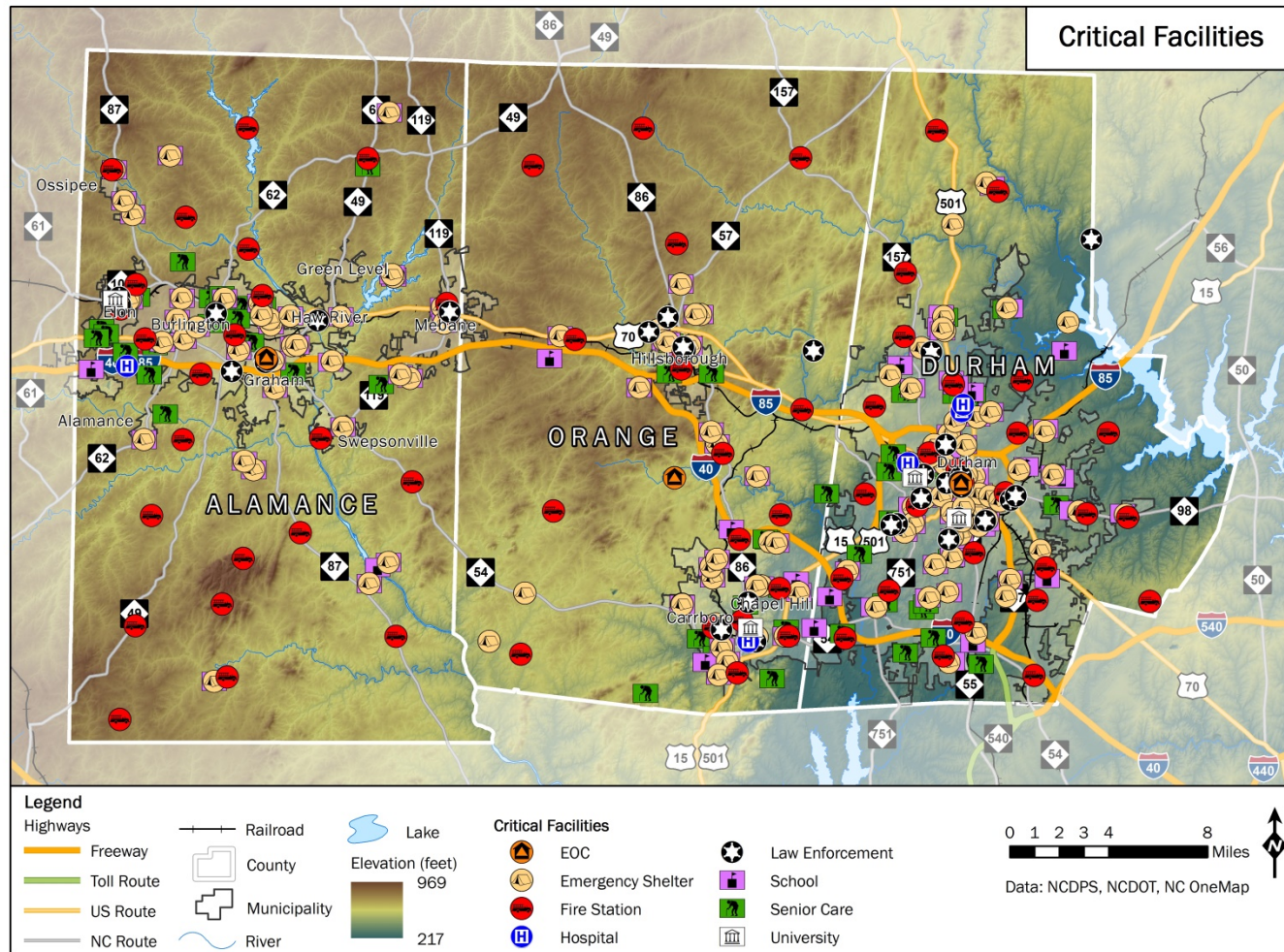
Table 4.5: Critical Facilities Counts by Jurisdiction

Jurisdiction	EOCs	Fire Stations	Hospitals ²	Police	Schools	Senior Care	Shelters	Universities
Alamance County (Unincorporated)	0	15	0	0	15	5	14	0
Alamance	0	0	0	0	0	0	0	0
Burlington	0	5	1	2	13	13	12	0
Elon	0	2	0	2	1	4	2	1
Graham	1	1	0	3	5	3	5	0
Green Level	0	0	0	1	0	0	0	0
Haw River	0	1	0	1	1	0	1	0
Mebane	0	2	0	1	2	0	2	0
Ossipee	0	1	0	0	1	0	1	0
Swepsonville	0	1	0	0	1	0	1	0
<i>Subtotal Alamance</i>	<i>1</i>	<i>28</i>	<i>1</i>	<i>10</i>	<i>39</i>	<i>25</i>	<i>38</i>	<i>1</i>
Orange County (Unincorporated)	1	14	0	2	14	4	13	0
Carrboro	0	2	0	1	5	2	1	0
Chapel Hill	0	5	1	3	14	7	14	1
Hillsborough	0	3	0	1	4	2	3	0
<i>Subtotal Orange</i>	<i>1</i>	<i>24</i>	<i>1</i>	<i>7</i>	<i>34</i>	<i>15</i>	<i>31</i>	<i>1</i>
Durham County (Unincorporated)	0	8	0	1	8	3	9	0
Durham	1	19	3	15	51	20	46	2
<i>Subtotal Durham</i>	<i>1</i>	<i>27</i>	<i>3</i>	<i>16</i>	<i>59</i>	<i>23</i>	<i>55</i>	<i>2</i>
TOTAL ENO-HAW	3	79	5	33	132	63	124	4

Source: NC iRISK and NC OneMap.

² Hospital and university counts are counts per campus and may not reflect actual number of buildings.

Figure 4.2: Critical Facilities Locations in the Eno-Haw Region



4.4.4 Infrastructure

Certain infrastructure elements as shown in **Table 4.6** were identified for analysis. These include major roads³, railroads, power plants, and water/wastewater facilities.

Table 4.6: Infrastructure Counts and Measurements (in Miles) by Jurisdiction

Jurisdiction	Major Roads	Railroad ⁴	Power Plants	Water/Wastewater Facilities
Alamance County (Unincorporated)	106.7	5.6	1	4
Alamance	1.1	0.0	0	0
Burlington	36.5	5.7	0	1
Elon	2.2	1.6	0	0
Graham	13.0	2.6	0	0
Green Level	1.8	0.0	0	0
Haw River	5.2	1.9	0	0
Mebane	7.7	1.5	0	1
Ossipee	1.2	0.0	0	0
Sweptsonville	0.8	0.0	0	0
<i>Subtotal Alamance</i>	<i>176.2</i>	<i>19.0</i>	<i>1</i>	<i>6</i>
Orange County (Unincorporated)	136.6	28.6	0	1
Carrboro	4.2	2.0	0	1
Chapel Hill	26.9	2.9	1	1
Hillsborough	3.6	1.3	0	1
<i>Subtotal Orange</i>	<i>171.2</i>	<i>34.7</i>	<i>1</i>	<i>4</i>
Durham County (Unincorporated)	83.3	20.3	0	1
Durham	142.5	36.6	0	3
<i>Subtotal Caldwell</i>	<i>225.8</i>	<i>56.9</i>	<i>0</i>	<i>4</i>
TOTAL ENO-HAW	573.3	110.6	2	14

Source: NCFMP; NCDOT.

The general locations of infrastructure elements across the planning area is shown in **Figure 4.3** along with High Potential Loss Properties, discussed in the following section.

³ The major roads and railroads accounted for in this table are the same as those depicted on the “Community Profile” map found in Section 2.

⁴ Does not include inactive/abandoned railroads.

4.4.5 High Potential Loss Properties

Table 4.7 shows counts of high potential loss properties attributed to each participating jurisdiction. **Figure 4.3** shows the general locations of these properties across the planning area.

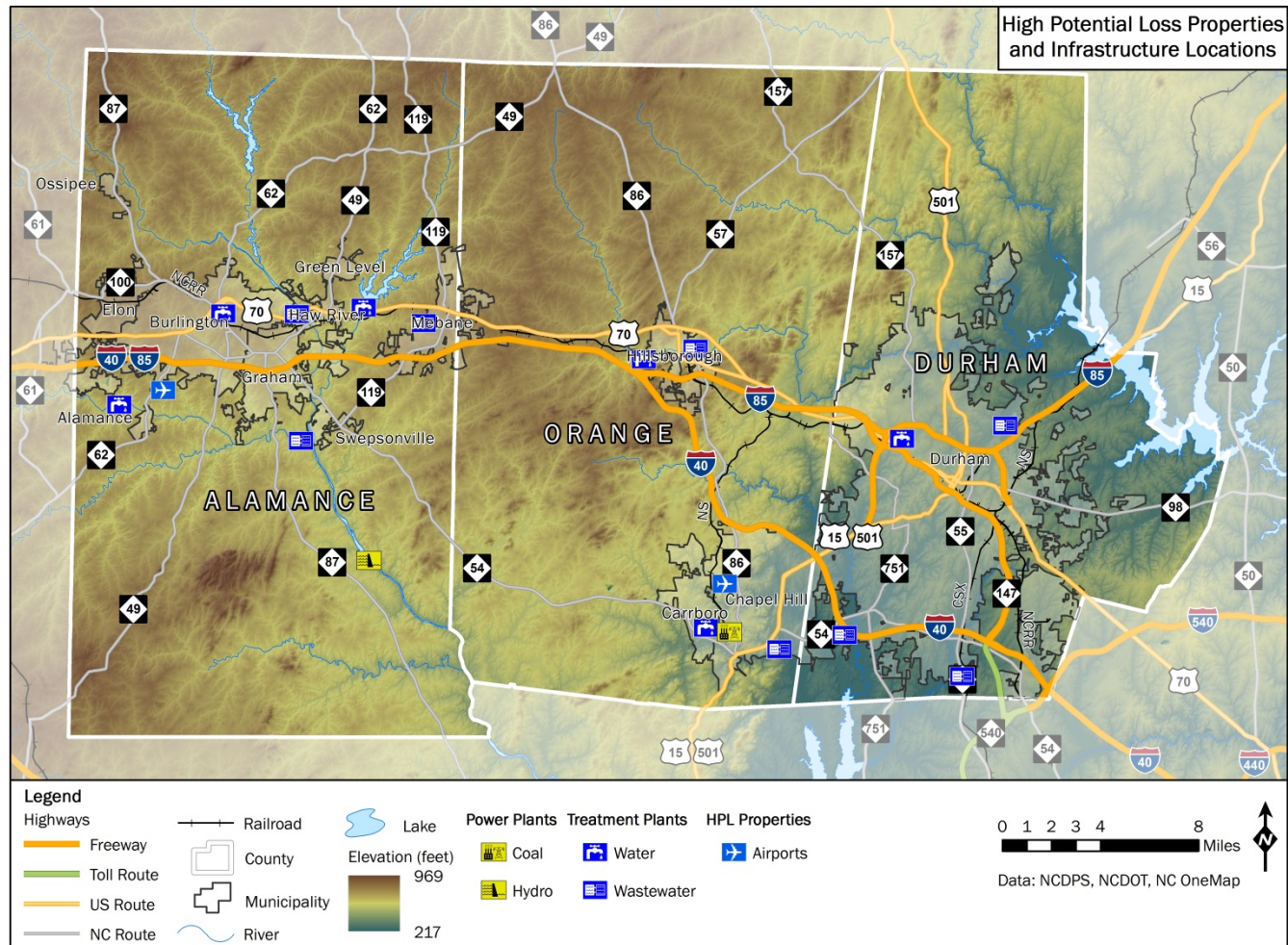
Table 4.7: High Potential Loss Properties by Jurisdiction

Jurisdiction	Major Airports	Dams ⁵	>\$1m
Alamance County (Unincorporated)	1	81	378
Alamance	0	0	7
Burlington	0	7	571
Elon	0	3	126
Graham	0	2	153
Green Level	0	0	1
Haw River	0	0	26
Mebane	0	4	100
Ossipee	0	0	8
Swepsonville	0	1	10
<i>Subtotal Alamance</i>	<i>1</i>	<i>98</i>	<i>1,380</i>
Orange County (Unincorporated)	0	35	94
Carrboro	0	3	69
Chapel Hill	1	4	550
Hillsborough	0	3	42
<i>Subtotal Orange</i>	<i>1</i>	<i>45</i>	<i>755</i>
Durham County (Unincorporated)	0	40	234
Durham	0	43	1,635
<i>Subtotal Durham</i>	<i>0</i>	<i>83</i>	<i>1,869</i>
TOTAL ENO-HAW	2	226	4,004

Source: NCDENR; NC OneMap.

⁵ Locations of dams are provided in the dam failure section and are not shown on the following map.

Figure 4.3: Locations of Infrastructure Elements and High Potential Loss Properties



4.4.6 Historic Properties

Historic property counts including historic districts, buildings, sites (such as farms, cemeteries, etc.) and landmarks were derived from the National Register of Historic Places (National Park Service) database and are shown in **Table 4.8**.

Table 4.8: Historic Property Counts by Jurisdiction

Jurisdiction	Districts ⁶	Buildings (Outside of Districts)	Sites/Other	Landmarks
Alamance County (Unincorporated Area)	2	13	0	0
Alamance	1	1	1	0
Burlington	6	19	1	0
Elon	1	1	0	0
Graham	3	3	0	0
Green Level	0	0	0	0
Haw River	1	0	1	0
Mebane	4	10	2	0
Ossipee	0	0	0	0
Sweepsonville	0	0	0	0
<i>Subtotal Alamance</i>	<i>18</i>	<i>47</i>	<i>5</i>	<i>0</i>
Orange County (Unincorporated Area)	1	4	1	0
Carrboro	2	1	1	0
Chapel Hill	5	6	5	2
Hillsborough	1	21	4	1
<i>Subtotal Orange</i>	<i>9</i>	<i>32</i>	<i>11</i>	<i>3</i>
Durham County (Unincorporated Area)	0	4	1	0
Durham	24	48	8	3
<i>Subtotal Durham</i>	<i>24</i>	<i>52</i>	<i>9</i>	<i>3</i>
TOTAL ENO-HAW	51	131	25	6

Source: National Park Service National Register of Historic Places.

Based on this information, there are a total of 51 historic districts, 131 buildings outside of historic districts, 25 other historic sites, and 6 historic landmarks in the planning area. Geospatial data and site-specific property values are not currently available and therefore further risk analysis is not possible at this time. However, the HMPT has taken into account these historic property counts in the development of potential mitigation actions.

⁶ Districts may include multiple buildings. Counts of individual buildings located in each historic district are not currently available.

4.5 Hazard Profiles, Analysis, and Vulnerability

As stated in subsection 4.2, the following hazards are addressed in this *Risk Assessment* and are presented in the following order in the subsections to follow:

Hydrologic Hazards (Water Hazards)

- Flood
- Dam/Levee Failure
- Drought/Extreme Heat

Atmospheric Hazards (Severe Storms)

- Thunderstorm, Lightning, and Hail
- Tornado
- Winter Weather
- Hurricane and Tropical Storm

Geologic Hazards

- Landslide
- Earthquake

Other Hazards

- Wildfire

4.5.1 Hydrologic Hazards (Water Hazards)

Hydrologic hazards are essentially “water-based” hazards that include flood, dam/levee failure, and drought/extreme heat. It is important to note that some hydrologic hazards result from the activity of atmospheric hazards, such as thunderstorms producing large amounts of rain, etc. The flood component of such composite hazards is covered here, whereas the wind component is covered under the Atmospheric Hazards subsection.

4.5.1.1 Flood

Flood Hazard Description

Flooding is the most frequent and costly natural hazard in the United States, a hazard that has caused more than 10,000 deaths since 1900. Nearly 90% of presidential disaster declarations result from natural events where flooding was a major component.

Riverine flooding is generally the result of excessive precipitation and one of the primary types of flooding analyzed for hazard mitigation planning purposes due to the availability of Digital Flood Insurance Rate Maps (DFIRMs) and other regulatory and non-regulatory flood risk mitigation products. The severity of a riverine flooding event is typically determined by a combination of several major factors, including: stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surface. Riverine floods can be long-term events that may last for several days.

Another major type of flooding and one that has caused multiple flood events in the planning area is flash flooding. Most flash flooding is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. However, flash flooding events may also occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall, or from a sudden release of water held by a retention basin or other stormwater control facility. Flash flooding is common in urbanized areas where much of the ground is covered by impervious surfaces and stormwater management issues can become a factor.

The periodic flooding of lands adjacent to rivers and streams (land known as floodplain) is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence intervals, and floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be inundated by the 10-year flood and the 100-year floodplain by the 100-year flood. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1-percent-annual-chance of occurring in any given year. The 500-year flood has a 0.2-percent-annual-chance of occurring in any given year.

Flood Hazard Analysis

There are numerous rivers and streams flowing through the planning area, including the Eno River, Haw River, Great Alamance Creek, and others. When heavy or prolonged rainfall events occur, these rivers and streams are susceptible to some degree of flooding. There have been a number of past flooding events throughout the planning area, ranging widely in terms of location, magnitude, and impact. The most frequent flooding events have been localized in nature, resulting from heavy rains in a short period of time over urbanized areas that are not able to adequately handle stormwater runoff. These events typically do not threaten lives or property and do not result in emergency or disaster declarations, therefore historical data is limited to the larger, most notable events.

Location Within the Planning Area

Figures 4.4 through **4.16** show the flood hazard boundaries associated with each municipal jurisdiction based on effective DFIRM data. These effective dates are 1/02/2008 for Alamance County, 5/16/2008 for Orange County, and 5/16/2008 for Durham County. The flood zones depicted on these maps, particularly the 1-percent-annual-chance and 0.2-percent-annual-chance floodplains, are the flood hazard boundaries used for the subsequent flood hazard analysis.

Extent (Magnitude and Severity)

This regional hazard analysis focuses on the two primary flood hazard extents shown in Figures 4.4 through 4.16: the 1-percent-annual-chance flood (100-year return period), and the 0.2-percent-annual-chance flood (500-year return period).

The U.S. Geological Survey maintains historical peak river stage information for three stations in Alamance County, eight stations in Durham County, and eight stations in Orange County. The station with the highest number of peaks in the Eno-Haw Region is the Flat River at Bahama station in Durham County (81 peaks dating from 1926 to 2006). The highest number of peaks in Alamance County (and the second highest in the region) is the Haw River at Haw River station with 78 peaks from 1929 to 2006. The highest number of peaks in Orange County (and the third highest in the region) is the Eno River at Hillsborough station with 64 peaks from 1928 to 2006.

Figure 4.4: Flood Hazard Areas in the Village of Alamance

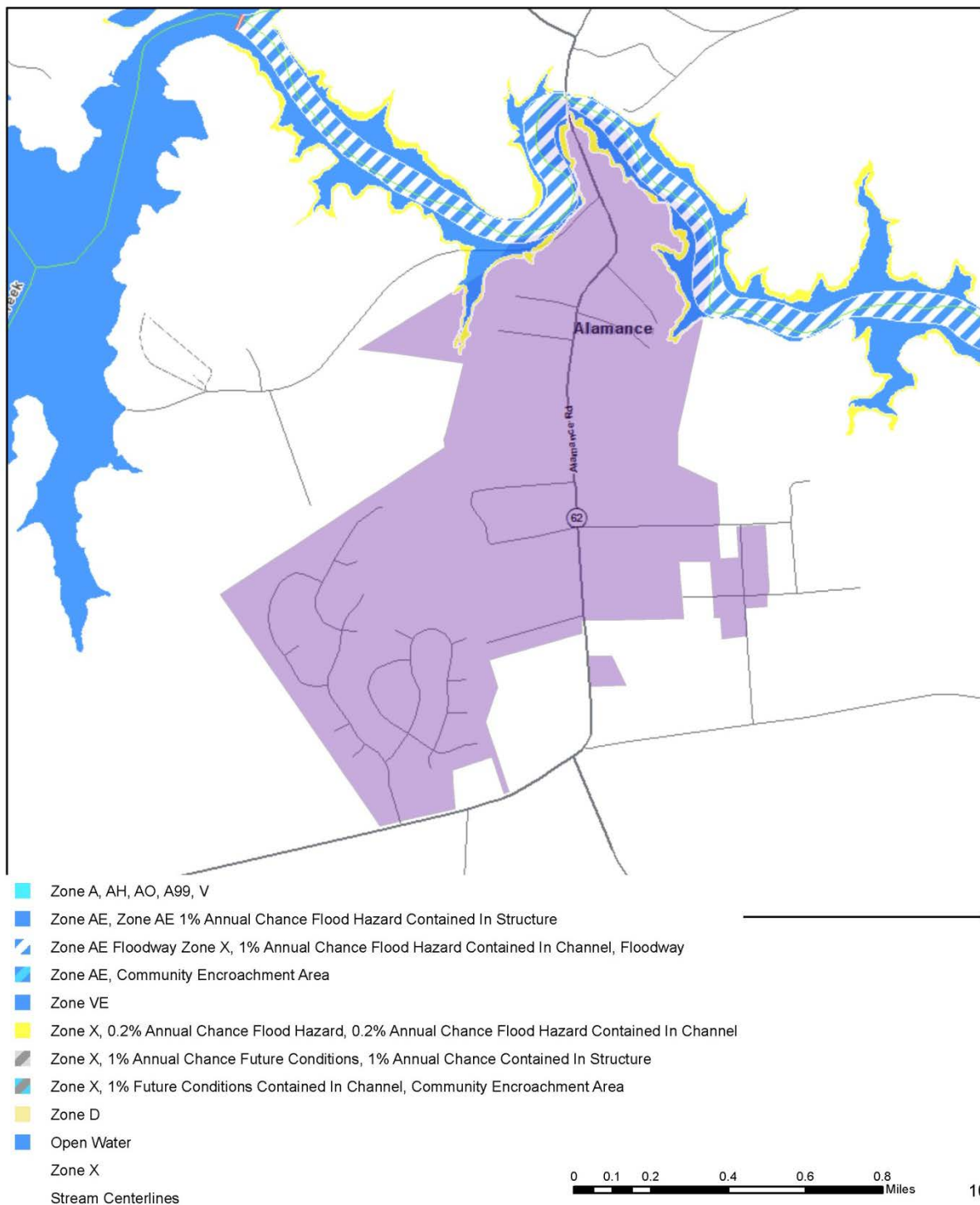


Figure 4.5: Flood Hazard Areas in the City of Burlington

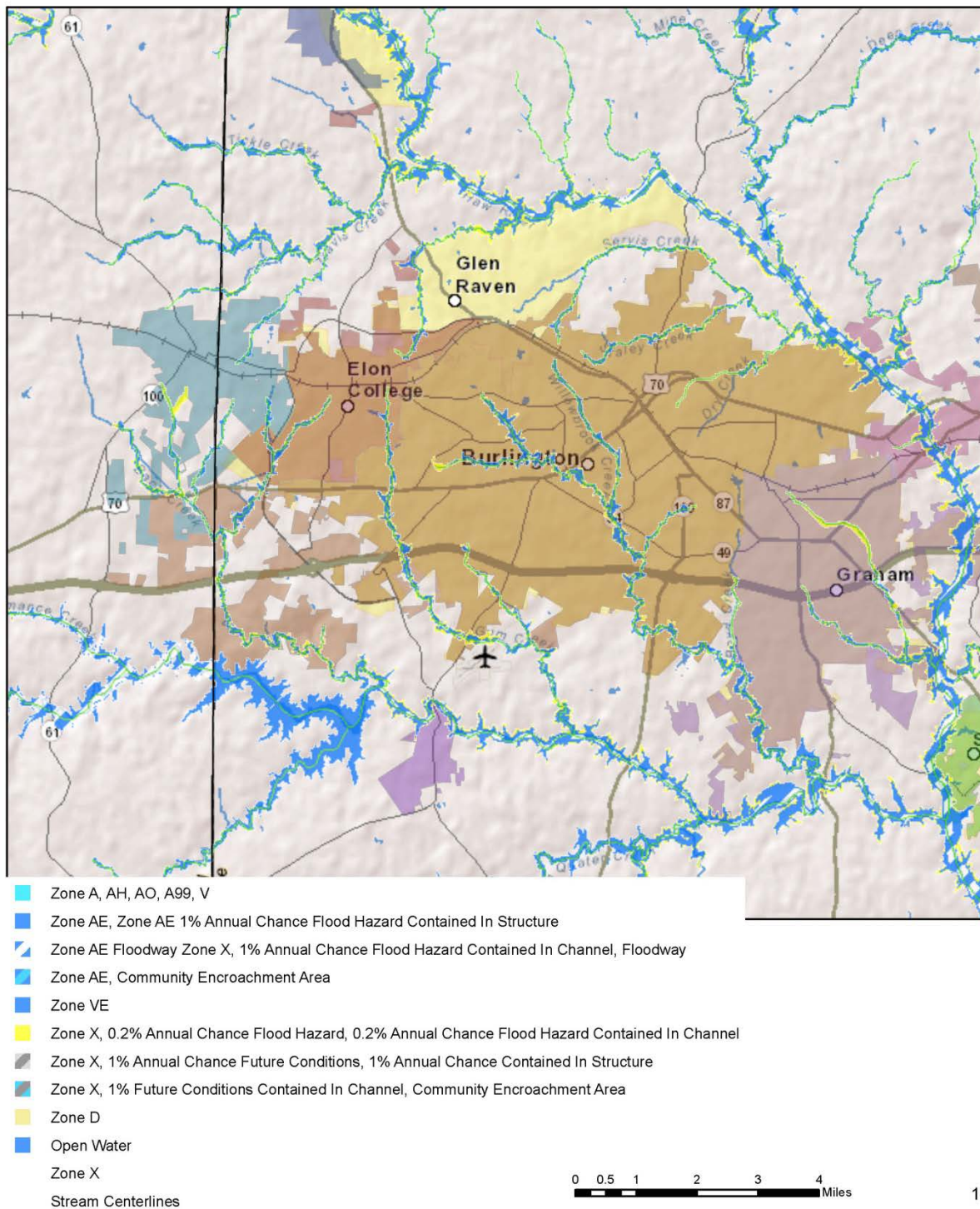


Figure 4.6: Flood Hazard Areas in the Town of Elon

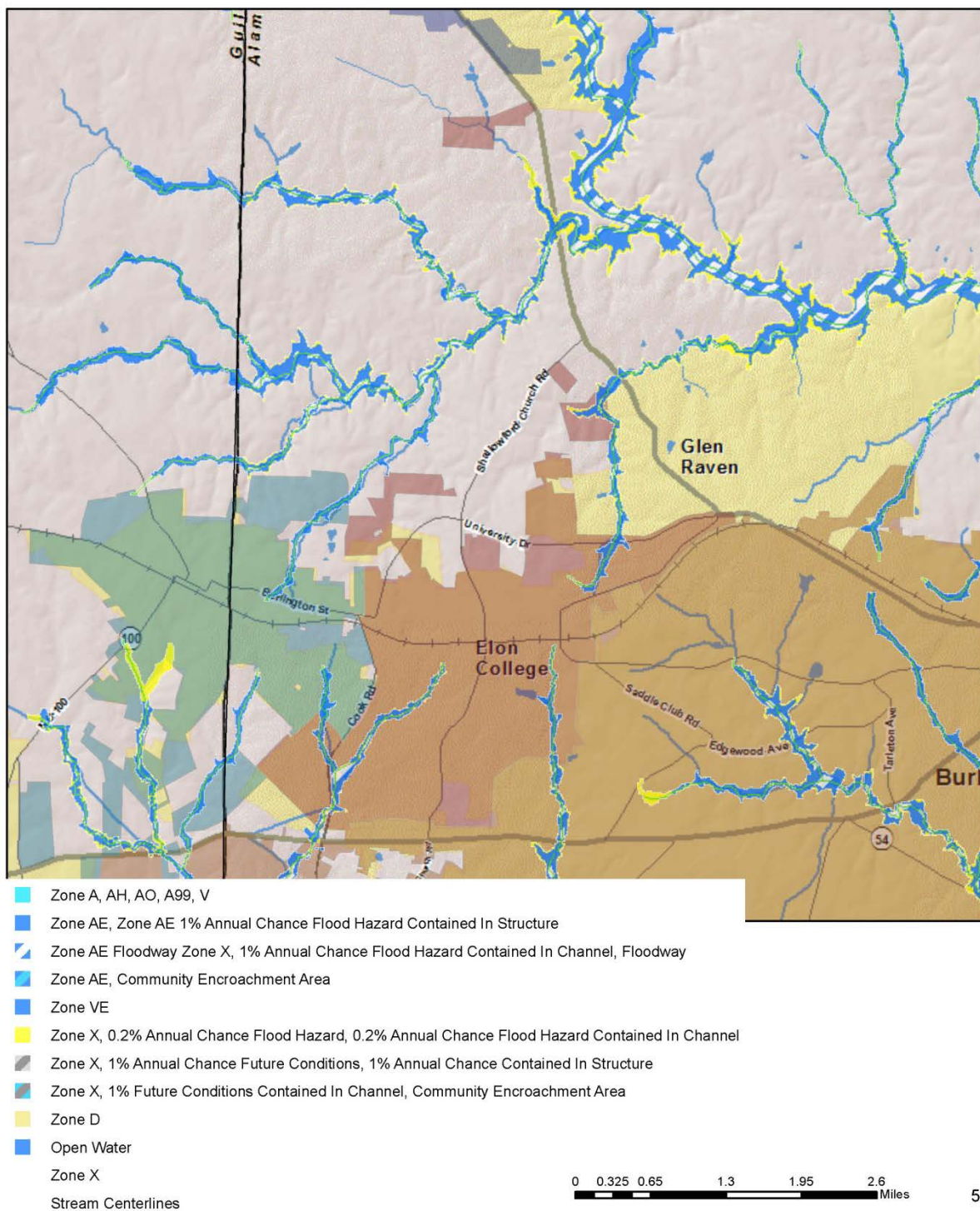


Figure 4.7: Flood Hazard Areas in the City of Graham

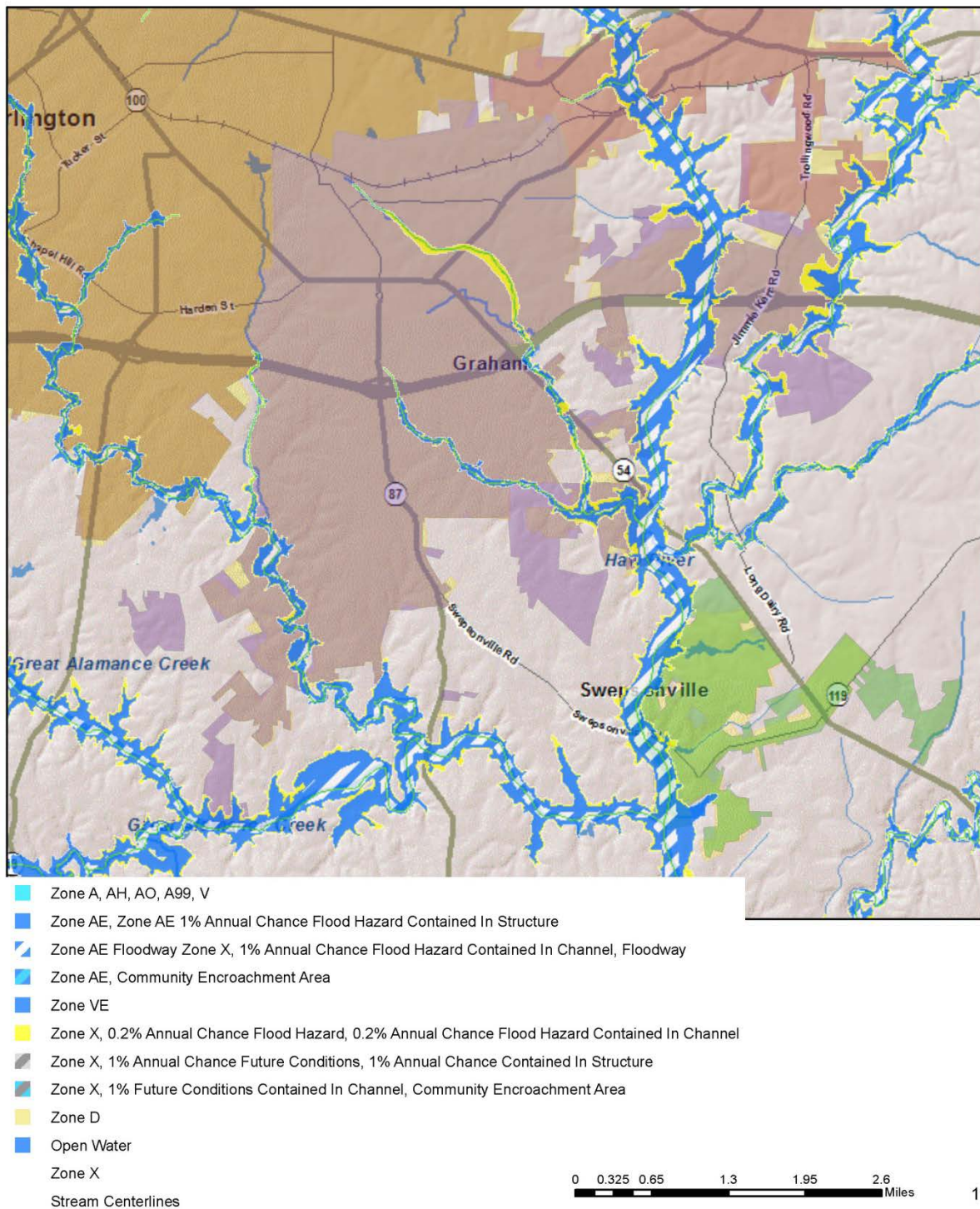


Figure 4.8: Flood Hazard Areas in the Town of Green Level

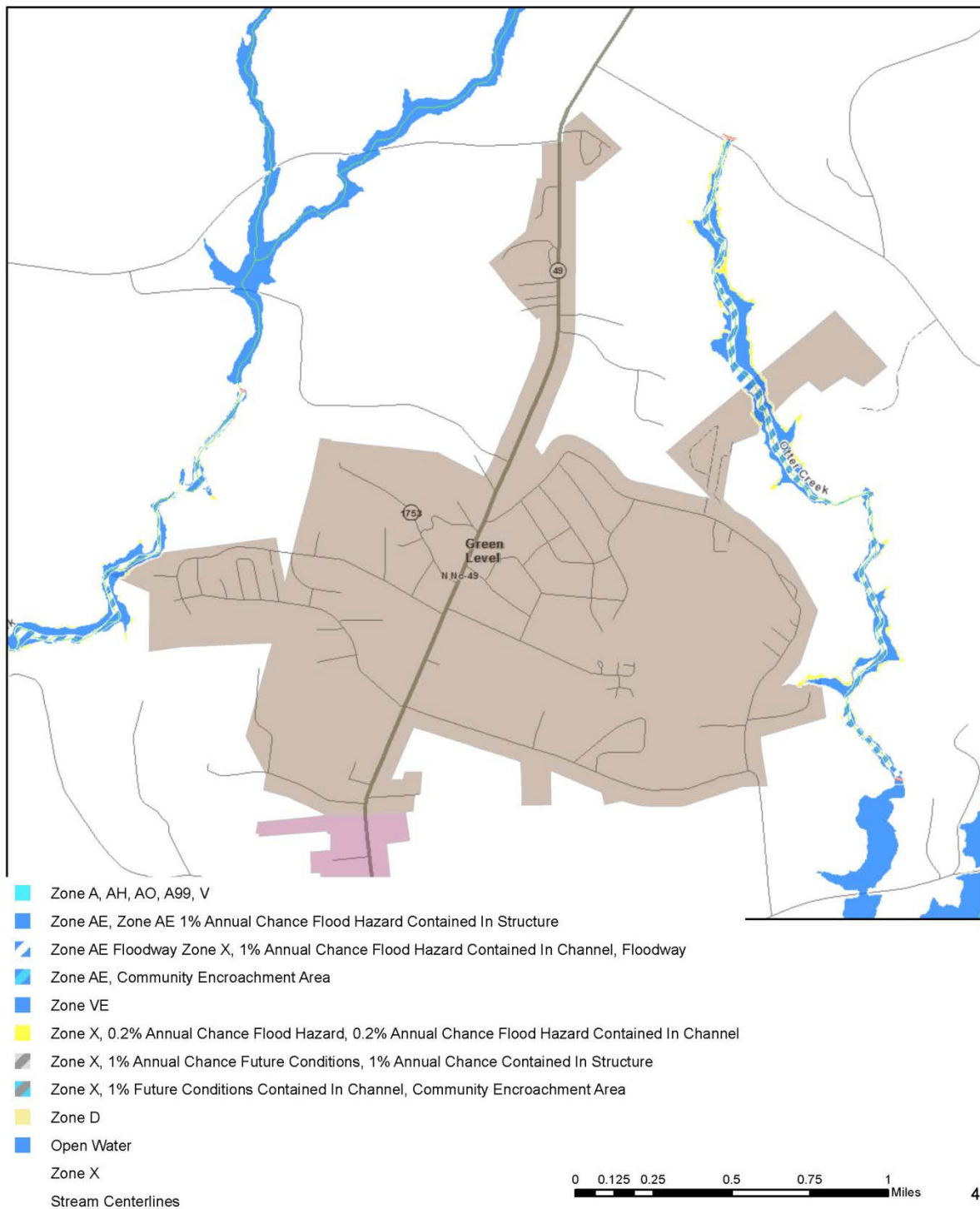


Figure 4.9: Flood Hazard Areas in the Town of Haw River

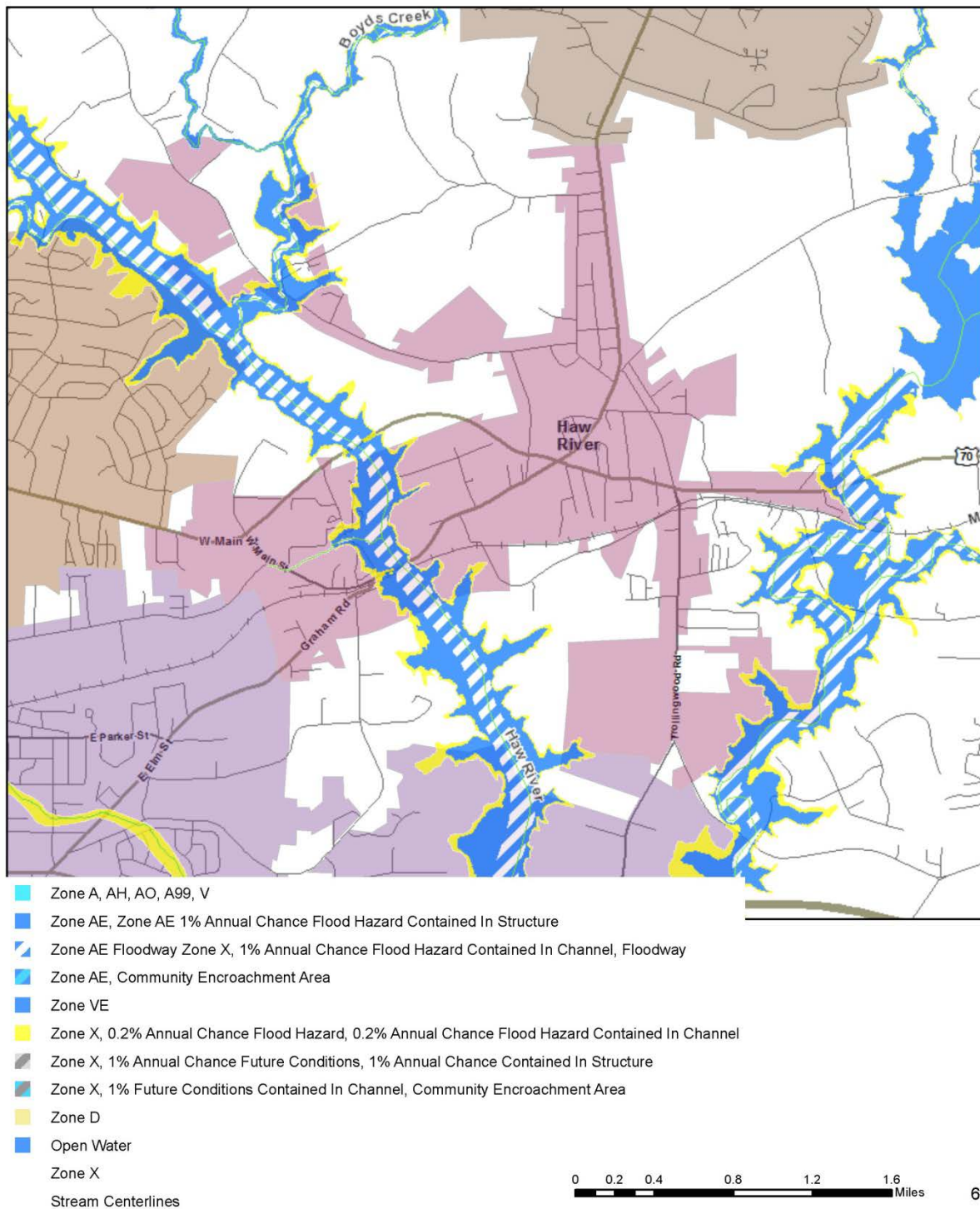


Figure 4.10: Flood Hazard Areas in the City of Mebane

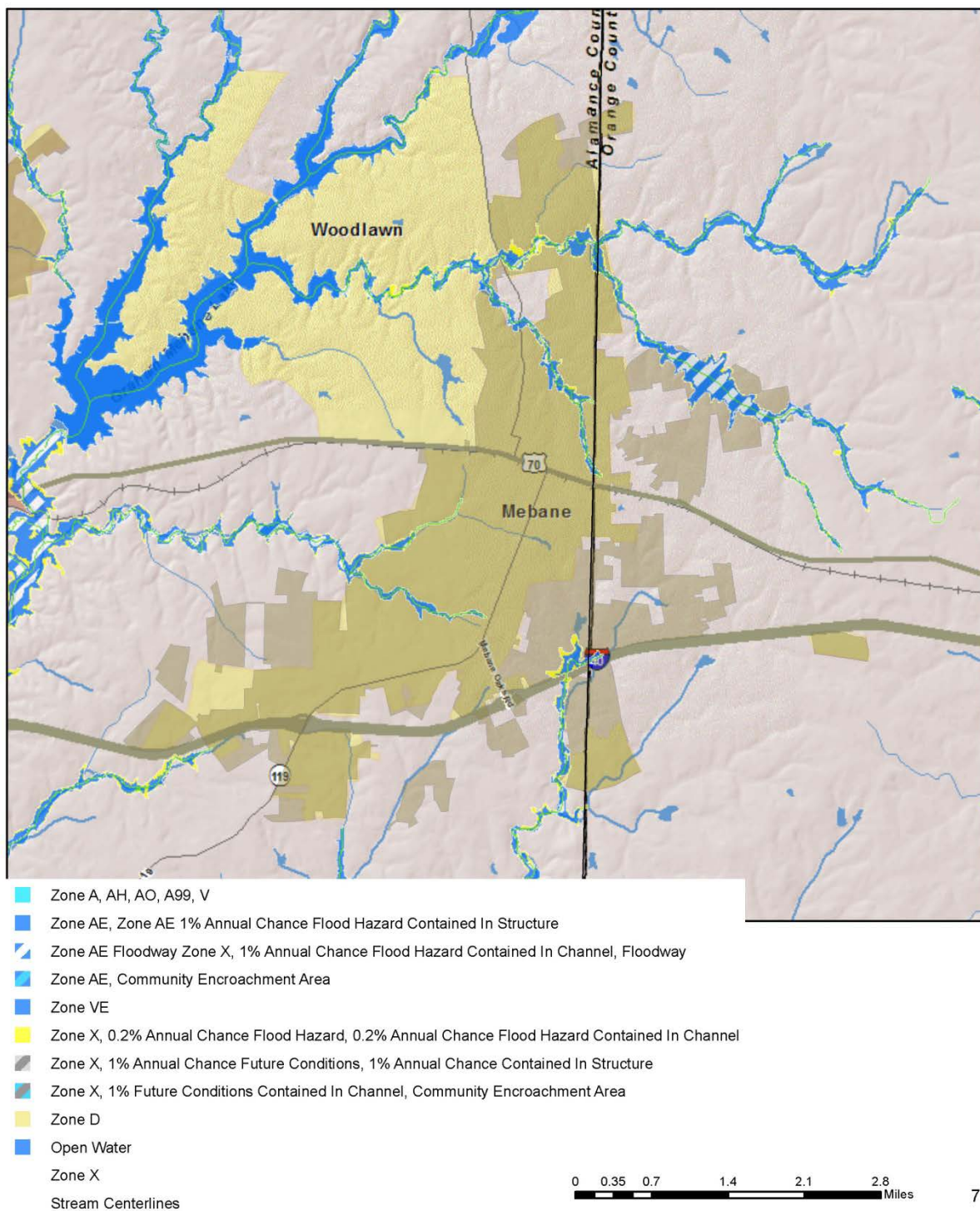


Figure 4.11: Flood Hazard Areas in the Town of Ossipee

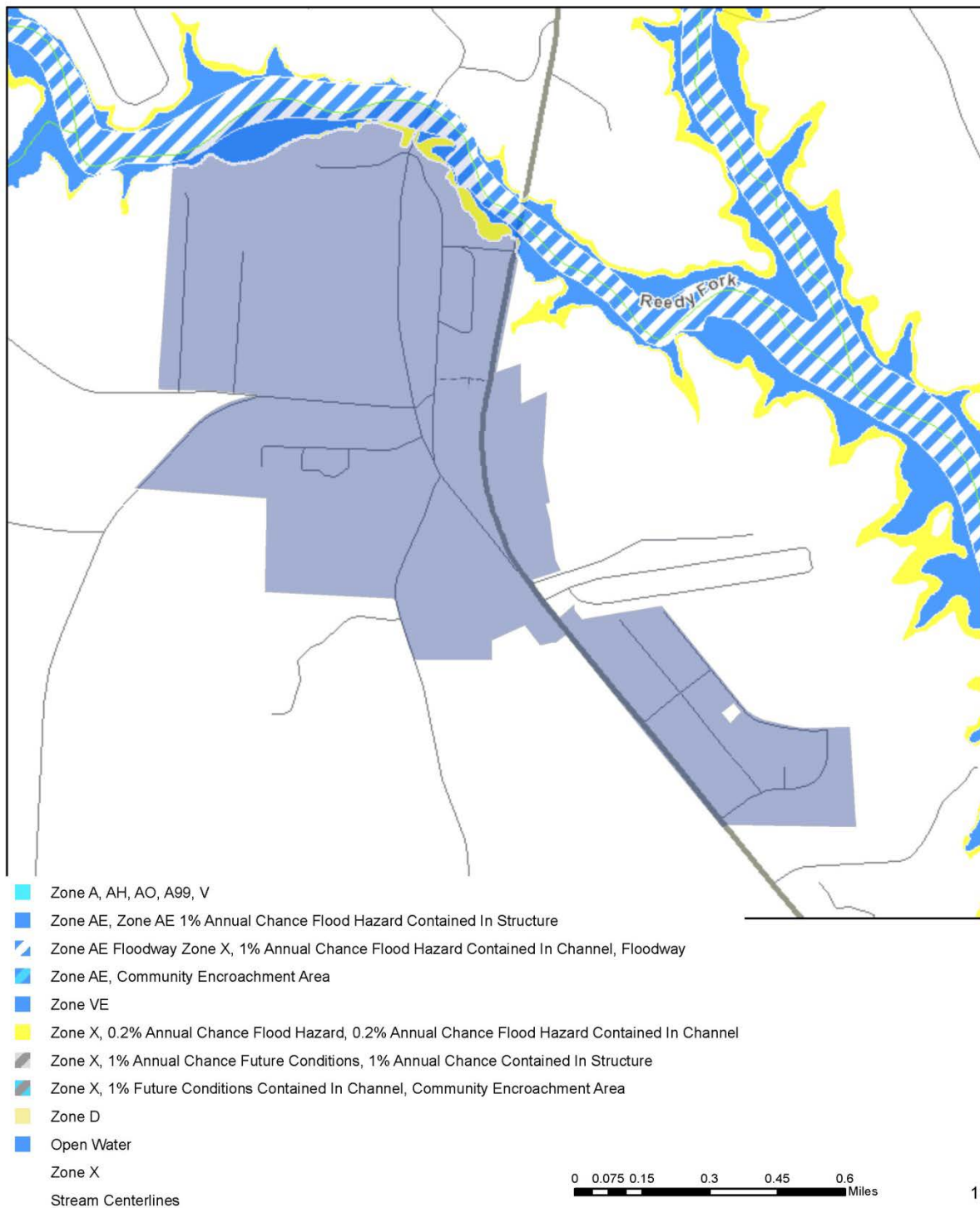


Figure 4.12: Flood Hazard Areas in the Town of Swepsonville

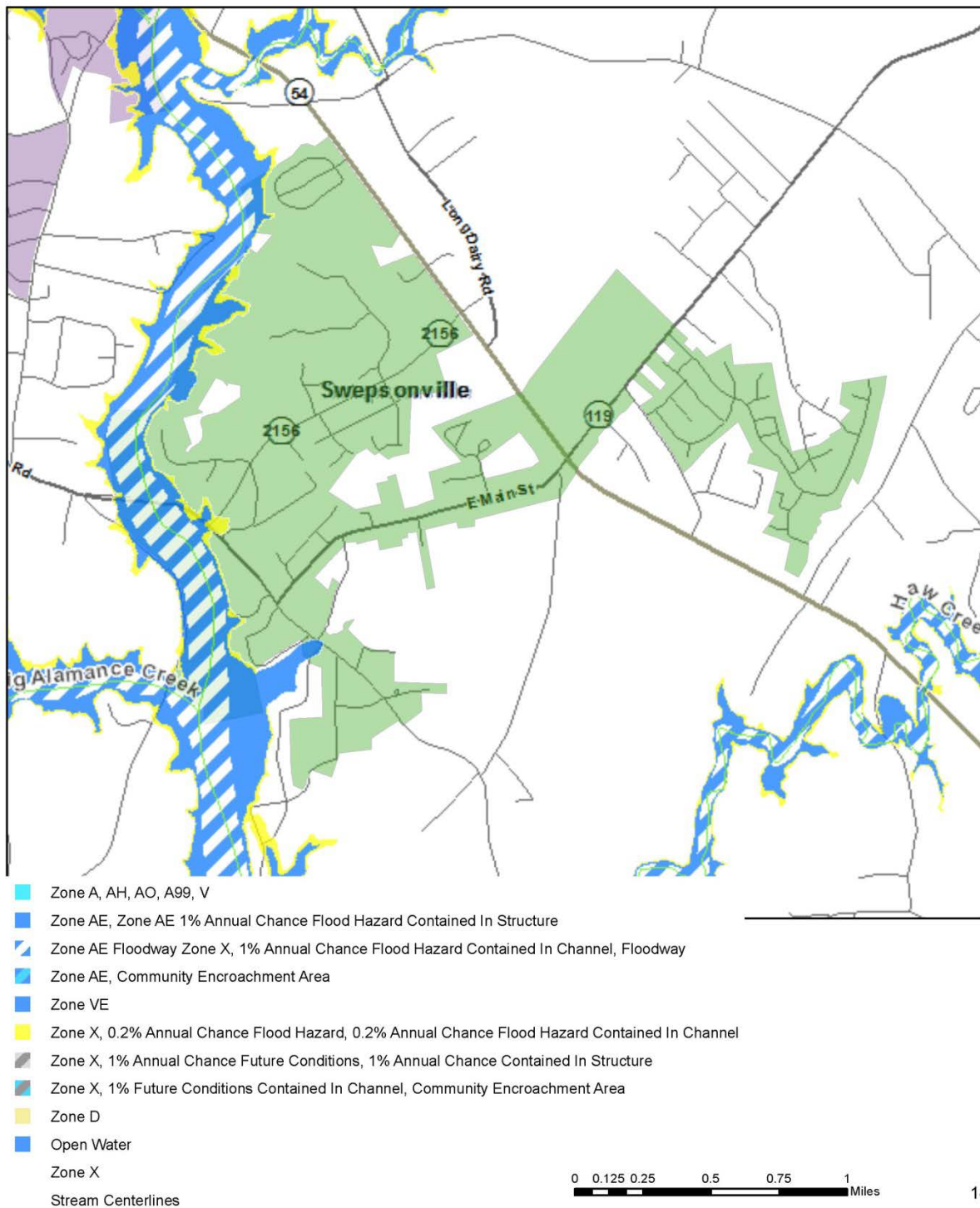
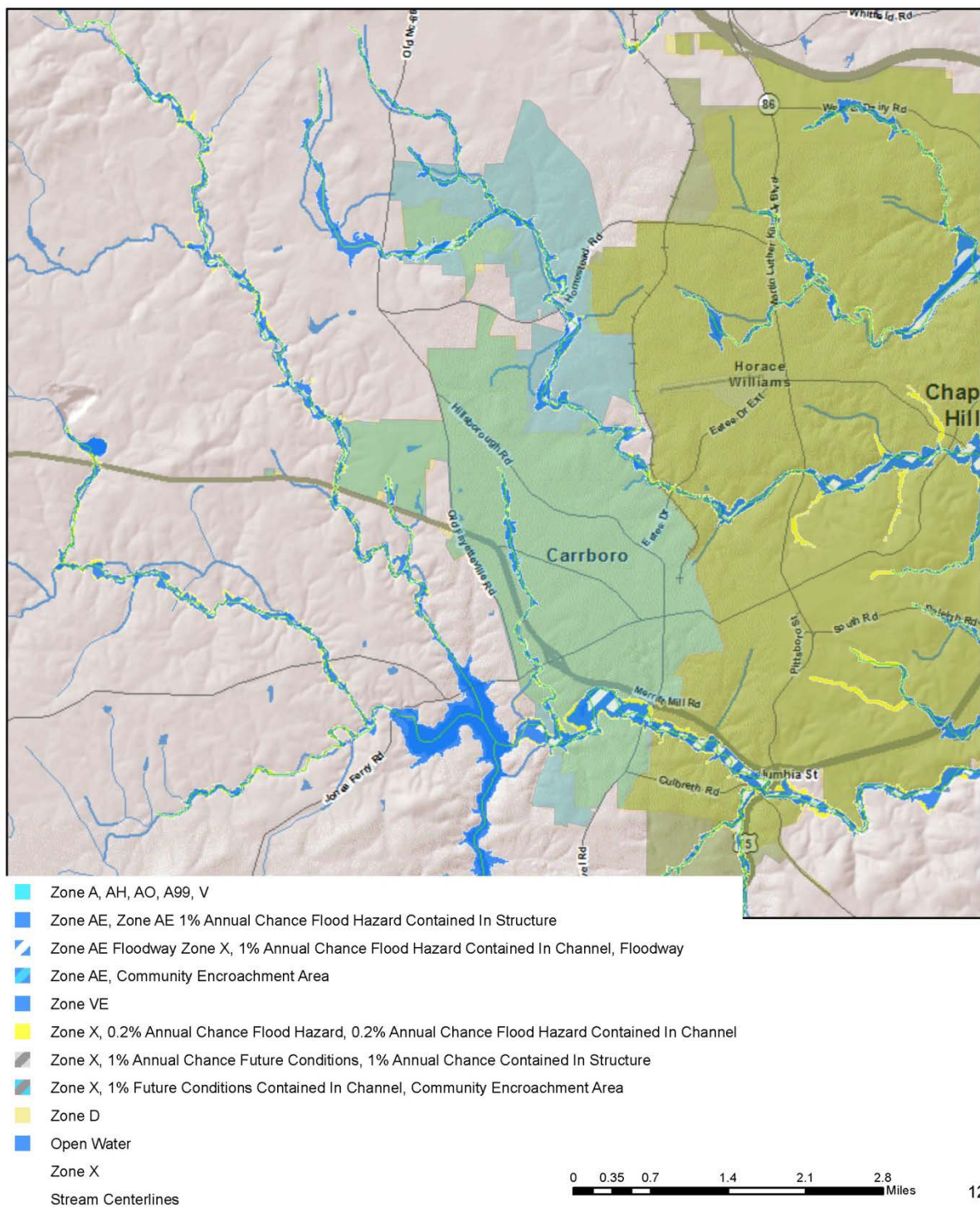


Figure 4.13: Flood Hazard Areas in the Town of Carrboro



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Figure 4.14: Flood Hazard Areas in the Town of Chapel Hill

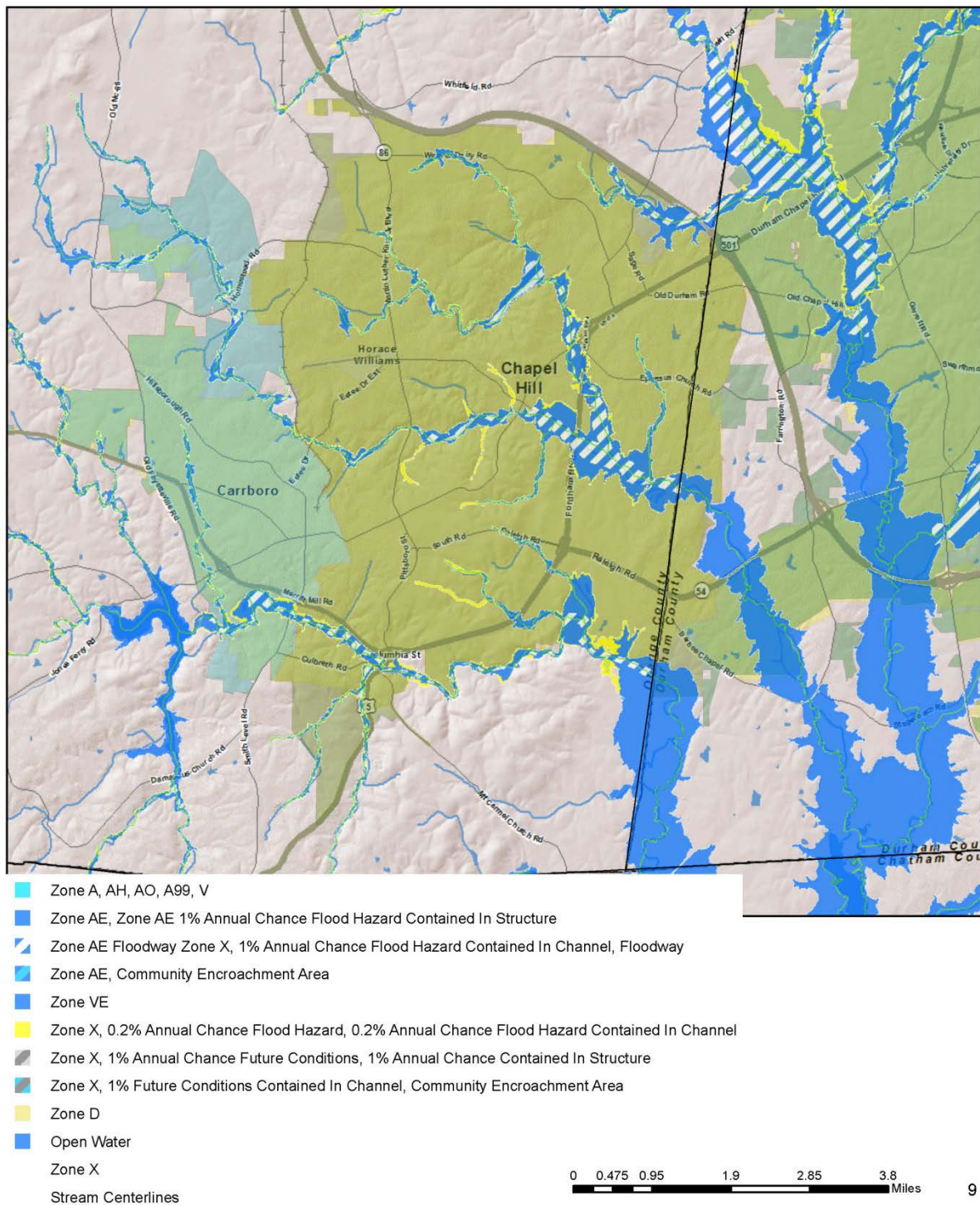


Figure 4.15: Flood Hazard Areas in the Town of Hillsborough

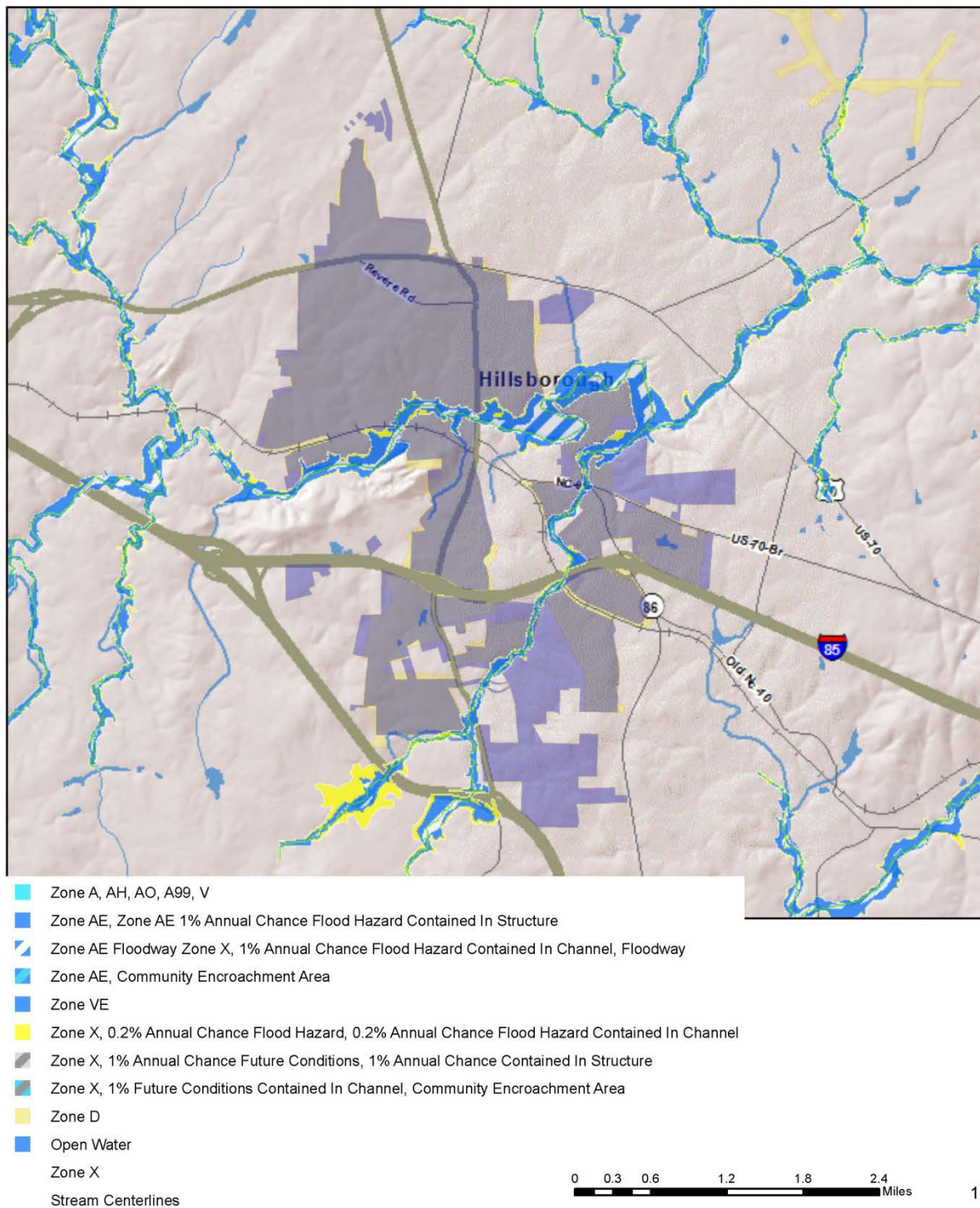
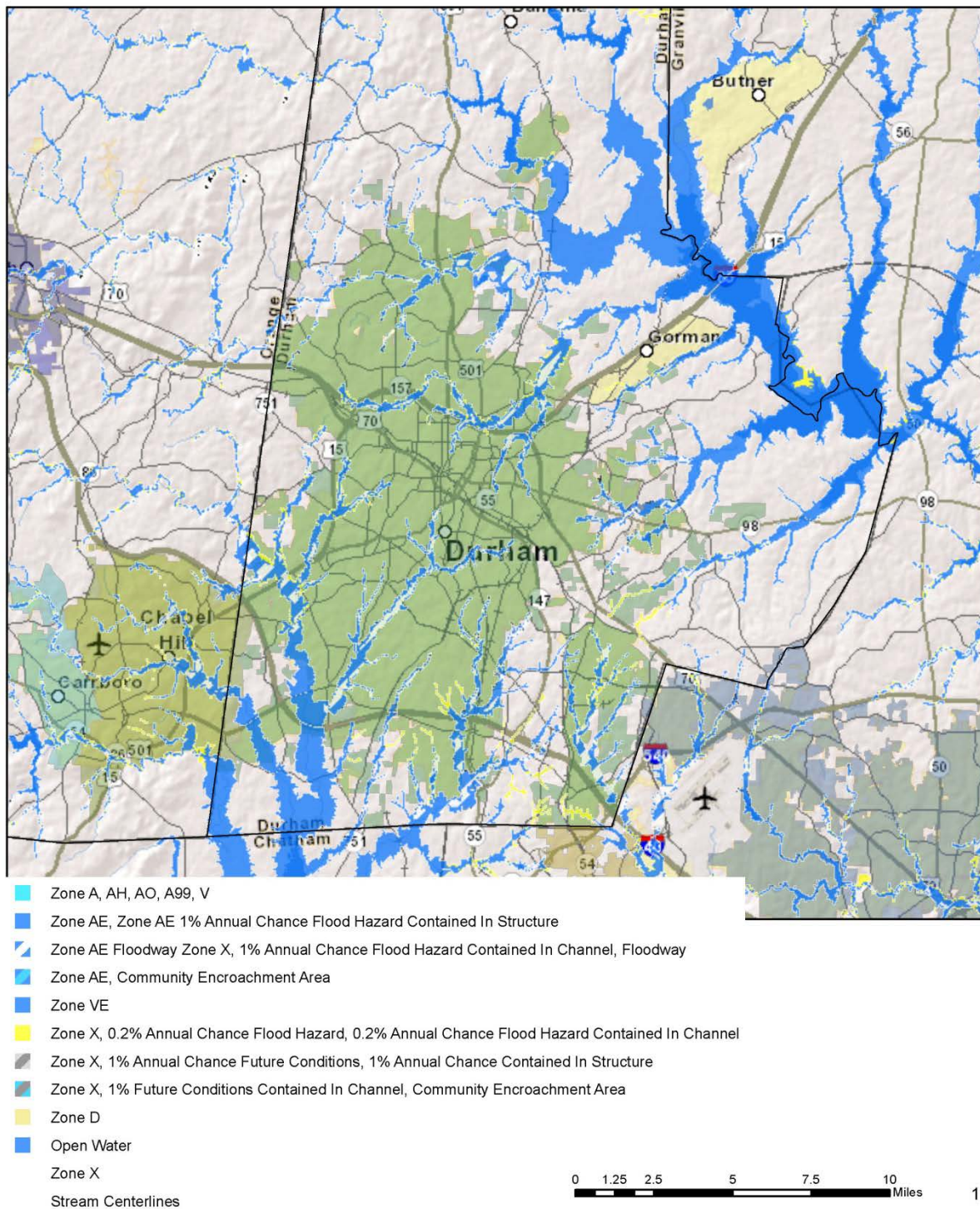


Figure 4.16: Flood Hazard Areas in the City of Durham



Historical Occurrences

The following historical occurrences ranging from 1996 to December 2014 have been identified based on the National Climatic Data Center (NCDC) Storm Events database (**Table 4.9**). It should be noted that only those historical occurrences listed in the NCDC database are shown here and that other, unrecorded or unreported events may have occurred within the planning area during this timeframe.

Table 4.9: Historical Occurrences of Flooding (1996-2014)

Location	Date	Type	Deaths	Injuries	Reported Property Damage	Reported Crop Damage
ALAMANCE COUNTY						
Countywide	9/6/1996	Flash Flood	0	0	0	0
Burlington	4/28/1997	Flash Flood	0	0	0	0
Elon College	6/14/1997	Flash Flood	0	0	0	0
Alamance (Zone)	2/4/1998	Flood	0	0	0	0
Countywide	9/4/1998	Flash Flood	0	0	0	0
Snow Camp	1/24/1999	Flood	0	0	0	0
Countywide	9/5/1999	Flash Flood	0	0	0	0
Countywide	7/23/2000	Flash Flood	0	0	0	0
Alamance (Zone)	3/20/2003	Flood	0	0	0	0
Alamance (Zone)	4/10/2003	Flood	0	0	0	0
Burlington	6/16/2003	Flash Flood	0	0	0	0
Mebane	7/13/2003	Flash Flood	0	0	1,400,000	0
Snow Camp	8/4/2003	Flash Flood	0	0	0	0
Alamance	8/5/2003	Flash Flood	0	0	0	0
Burlington	8/9/2003	Flash Flood	0	0	0	0
Graham	6/9/2004	Flash Flood	0	0	0	0
Mebane	12/10/2004	Flash Flood	0	0	0	0
Graham	6/7/2005	Flash Flood	0	0	0	0
Burlington	6/23/2006	Flash Flood	0	0	0	0
Altamahaw	8/27/2008	Flash Flood	0	0	0	0
Elon College	8/27/2008	Flash Flood	0	0	0	0
Sweponville	9/6/2008	Flash Flood	0	0	0	0
Just XRDS	9/6/2008	Flash Flood	0	0	500,000	0
Alamance County	6/28/2011	Flash Flood	0	0	0	0
Burlington Airport	6/25/2013	Flash Flood	0	0	0	0
Saxapahaw	3/7/2014	Flood	0	0	0	0
<i>Subtotal Alamance</i>	<i>26 Events</i>		<i>0</i>	<i>0</i>	<i>1,900,000</i>	<i>0</i>
ORANGE COUNTY						
Countywide	9/6/1996	Flash Flood	0	0	0	0
Chapel Hill	3/19/1998	Flash Flood	0	0	0	0
Countywide	9/5/1999	Flash Flood	0	0	0	0
Countywide	9/28/1999	Flash Flood	0	0	0	0
Chapel Hill	7/23/2000	Flash Flood	0	0	6,400,000	0

Location	Date	Type	Deaths	Injuries	Reported Property Damage	Reported Crop Damage
Miles	7/13/2003	Flash Flood	0	0	0	0
Orange (Zone)	3/20/2003	Flood	0	0	0	0
North Portion	8/9/2003	Flash Flood	0	0	0	0
Hillsborough	8/17/2004	Flash Flood	0	0	0	0
Hillsborough	6/14/2006	Flash Flood	0	0	0	0
Efland	6/24/2006	Flash Flood	0	0	0	0
Chapel Hill	7/25/2006	Flash Flood	0	0	0	0
Blackwood	9/6/2008	Flash Flood	0	0	150,000	0
Blackwood	1/25/2010	Flash Flood	0	0	0	0
Chapel Hill	5/27/2011	Flash Flood	0	0	0	0
Chapel Hill Wlms Ar	9/6/2012	Flash Flood	0	0	0	0
Chapel Hill Wlms Ar	6/30/2013	Flash Flood	0	0	0	0
Chapel Hill Wlms Ar	6/30/2013	Flash Flood	0	0	3,600,000	0
Chapel Hill	6/30/2013	Flash Flood	0	0	500,000	0
Chapel Hill	5/15/2014	Flash Flood	0	0	0	0
Glenn	5/15/2014	Flash Flood	0	0	10,000	0
<i>Subtotal Orange</i>	<i>21 Events</i>		<i>0</i>	<i>0</i>	<i>10,660,000</i>	<i>0</i>
DURHAM COUNTY						
Bahama	6/20/1996	Flash Flood	0	0	0	0
Bahama	6/24/2006	Flash Flood	0	0	0	0
Bahama	6/24/2006	Flash Flood	0	0	0	0
Bahama	8/27/2008	Flash Flood	0	0	100,000	0
Braggtown	7/15/2014	Flash Flood	0	0	2,500	0
Countywide	9/6/1996	Flash Flood	0	0	0	0
Countywide	7/24/1997	Flash Flood	0	0	0	0
Countywide	9/5/1999	Flash Flood	0	0	0	0
Countywide	9/16/1999	Flash Flood	0	0	0	0
Countywide	9/27/1999	Flash Flood	0	0	0	0
Countywide	9/28/1999	Flash Flood	0	0	0	0
Countywide	9/30/1999	Flash Flood	0	0	0	0
Countywide	8/9/2003	Flash Flood	0	0	0	0
Durham	8/7/1996	Flash Flood	0	0	20,000	0
Durham	9/6/1996	Flash Flood	0	0	0	0
Durham	4/28/1997	Flash Flood	0	0	0	0
Durham	3/19/1998	Flash Flood	0	0	0	0
Durham	7/23/2000	Flash Flood	0	0	0	0
Durham	8/4/2000	Flash Flood	0	0	0	0
Durham	6/22/2001	Flash Flood	0	0	0	0
Durham	10/11/2002	Flash Flood	0	0	0	0
Durham	10/11/2002	Flash Flood	0	0	0	0
Durham	5/23/2004	Flash Flood	0	0	0	0

Location	Date	Type	Deaths	Injuries	Reported Property Damage	Reported Crop Damage
Durham	8/12/2004	Flash Flood	0	0	0	0
Durham	7/13/2006	Flash Flood	0	0	0	0
Durham	11/16/2006	Flash Flood	0	0	0	0
Durham	6/11/2014	Flash Flood	0	0	0	0
Durham County	9/1/2013	Flash Flood	0	0	0	0
East Durham	9/6/2011	Flash Flood	0	0	0	0
Few	5/15/2014	Flash Flood	0	0	0	0
Hayes	6/30/2013	Flash Flood	0	0	0	0
Hope Valley	6/7/2013	Flash Flood	0	0	0	0
Hope Valley	6/30/2013	Flash Flood	0	0	7,500	0
Hope Valley	7/21/2014	Flash Flood	0	0	0	0
Hope Valley	7/21/2014	Flash Flood	0	0	0	0
Hope Valley	7/21/2014	Flash Flood	0	0	0	0
Huckleberry Spg	5/28/2010	Flash Flood	0	0	50,000	0
Lowes Grove	5/27/2011	Flash Flood	0	0	0	0
Oak Grove	9/6/2008	Flash Flood	0	0	0	0
Oak Grove	12/2/2009	Flash Flood	0	0	0	0
Orange Factory	9/6/2008	Flash Flood	0	0	0	0
Quail Roost	8/2/2004	Flash Flood	0	0	0	0
Quail Roost	5/22/2010	Flash Flood	0	0	0	0
Durham (Zone)	3/20/2003	Flood	0	0	0	0
Durham (Zone)	4/10/2003	Flood	0	0	0	0
Quail Roost	3/7/2014	Flood	0	0	0	0
<i>Subtotal Durham</i>	<i>46 Events</i>		<i>0</i>	<i>0</i>	<i>180,000</i>	<i>0</i>
TOTAL ENO-HAW	93 Events		0	0	12,740,000	0

Source: National Climatic Data Center Storm Events Database.

Based on the information presented above, 94 instances of flooding conditions have been recorded by NCDC since 1996, causing an estimated total of \$12,740,000 in losses to property, \$0 in losses to agricultural crops, 0 deaths, and 0 injuries within the planning area.

Table 5.2 in Section 5: *Capability Assessment* lists the number of insured losses and total claims payments for historical flood damages in each jurisdiction as recorded under the NFIP. **Table 4.10** below provides the NFIP entry date for each participating jurisdiction. As explained in subsection 4.3, the NFIP entry date for each jurisdiction was used to determine buildings that were built pre-FIRM and are therefore assumed to be at greater risk to the flood hazard.

Table 4.10: NFIP Entry Dates

Jurisdiction	NFIP Entry Date
Alamance County (Unincorporated)	12/1/1981
Alamance	12/17/1987
Burlington	4/1/1981
Elon	6/5/1989
Graham	11/19/1980
Green Level	12/22/1998
Haw River	11/5/1980
Mebane	11/5/1980
Ossipee	Non-participating
Swepsonville	12/1/1981
Orange County (Unincorporated)	3/16/1981
Carrboro	6/25/1976
Chapel Hill	4/17/1978
Hillsborough	5/15/1980
Durham County (Unincorporated)	2/15/1979
Durham	1/3/1979

Source: Federal Emergency Management Agency Community Status Book Report: Communities Participating in the National Flood Program, December 2014

Probability of Future Occurrences

Based on the information provided above, it is assumed that the probability of future flood hazard occurrences in the planning area is highly likely.

Flood Hazard Vulnerability

The following tables provide counts and values by jurisdiction relevant to flood hazard vulnerability in the Eno-Haw Region.

Table 4.11: Exposure to the 1-Percent-Annual-Chance (100-year) Flood

Jurisdiction	Number of Developed Parcels At Risk		Number of Undeveloped Parcels At Risk		Number of Buildings At Risk		Value of Buildings At Risk	Number of Pre-FIRM Buildings At Risk		Population At Risk		Elderly Population At Risk		Children At Risk	
	Num	Per	Num	Per	Num	Per ⁷		Num	Per ⁸	Num	Per	Num	Per	Num	Per
Alamance County (Unincorporated)	2,876	8.8%	1,502	4.6%	284	0.7%	\$293,958,871	100	0.7%	554	0.9%	87	1.0%	32	1.0%
Alamance	19	4.5%	7	1.7%	3	0.6%	\$13,066	1	0.4%	2	0.3%	0	0.3%	0	0.2%
Burlington	798	3.8%	254	1.2%	354	1.4%	\$84,253,135	276	1.7%	705	1.4%	111	1.4%	50	1.4%
Elon	88	3.9%	49	2.2%	40	1.6%	\$4,842,266	35	2.6%	93	1.0%	15	1.0%	2	1.0%
Graham	162	2.7%	80	1.3%	61	0.9%	\$29,492,751	13	0.3%	138	1.0%	20	1.0%	10	1.0%
Green Level	4	0.6%	5	0.7%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Haw River	38	3.5%	33	3.1%	23	1.5%	\$27,511,975	22	2.2%	39	1.7%	6	1.8%	2	1.2%
Mebane	156	3.1%	60	1.2%	50	1.2%	\$6,214,764	7	0.4%	115	1.0%	12	1.0%	9	1.0%
Ossipee	3	1.1%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sweptsonville	15	2.2%	10	1.5%	2	0.3%	\$479,403	1	0.3%	0	0.0%	0	0.0%	0	0.0%
<i>Subtotal Alamance</i>	<i>4,159</i>	<i>5.9%</i>	<i>2,000</i>	<i>2.9%</i>	<i>817</i>	<i>1.0%</i>	<i>\$446,766,231</i>	<i>513</i>	<i>1.0%</i>	<i>1,646</i>	<i>1.1%</i>	<i>251</i>	<i>1.1%</i>	<i>105</i>	<i>1.1%</i>
Orange County (Unincorporated)	1,520	5.4%	1,137	4.0%	92	0.3%	\$49,762,167	25	0.2%	186	0.4%	20	0.3%	9	0.3%
Carrboro	219	4.2%	61	1.2%	96	1.8%	\$16,733,580	24	1.9%	212	1.1%	11	1.1%	12	1.1%
Chapel Hill	781	5.9%	209	1.6%	418	2.9%	\$259,524,171	345	5.1%	776	1.4%	71	1.4%	33	1.4%
Hillsborough	72	2.5%	47	1.6%	12	0.4%	\$3,278,290	11	0.6%	20	0.3%	2	0.3%	1	0.3%
<i>Subtotal Orange</i>	<i>2,592</i>	<i>5.2%</i>	<i>1,454</i>	<i>2.9%</i>	<i>618</i>	<i>1.2%</i>	<i>\$329,298,208</i>	<i>405</i>	<i>2.0%</i>	<i>1,194</i>	<i>0.9%</i>	<i>104</i>	<i>0.8%</i>	<i>55</i>	<i>0.8%</i>
Durham County (Unincorporated)	1,376	6.6%	1,341	6.1%	313	1.3%	\$206,467,097	104	0.7%	522	1.3%	55	0.9%	38	1.7%
Durham	3,305	4.1%	1,334	1.7%	1,121	0.9%	\$202,230,834	772	2.0%	2,623	1.1%	231	1.1%	202	1.1%
<i>Subtotal Durham</i>	<i>4,681</i>	<i>4.6%</i>	<i>2,675</i>	<i>2.6%</i>	<i>1,434</i>	<i>1.0%</i>	<i>\$408,697,931</i>	<i>876</i>	<i>1.6%</i>	<i>3,145</i>	<i>1.2%</i>	<i>286</i>	<i>1.1%</i>	<i>240</i>	<i>1.2%</i>
TOTAL ENO-HAW	11,432	5.2%	6,129	2.8%	2,869	1.2%	\$1,184,762,370	1,794	1.5%	5,985	1.1%	641	1.1%	400	1.1%

Source: GIS Analysis

⁷ Percent of total number of buildings in jurisdiction.

⁸ Percent of total number of pre-FIRM buildings in jurisdiction.

Table 4.12: Exposure to the 0.2-Percent-Annual-Chance (500-year) Flood

Jurisdiction	Number of Developed Parcels At Risk		Number of Undeveloped Parcels At Risk		Number of Buildings At Risk		Value of Buildings At Risk	Number of Pre-FIRM Buildings At Risk		Population At Risk		Elderly Population At Risk		Children At Risk	
	Num	Per	Num	Per	Num	Per		Num	Per	Num	Per	Num	Per	Num	Per
Alamance County (Unincorporated)	205	0.6%	89	0.3%	254	0.6%	\$106,351,154	133	0.6%	494	0.8%	78	0.9%	29	0.9%
Alamance	8	1.9%	2	0.5%	2	0.4%	\$0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Burlington	99	0.5%	27	0.1%	113	0.5%	\$40,784,437	65	0.4%	187	0.4%	29	0.4%	13	0.4%
Elon	1	0.0%	2	0.1%	6	0.2%	\$3,652,535	3	0.2%	7	0.1%	1	0.1%	0	0.1%
Graham	111	1.8%	52	0.9%	87	1.3%	\$30,950,322	50	1.2%	183	1.3%	27	1.3%	14	1.3%
Green Level	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Haw River	23	2.1%	7	0.6%	24	1.6%	\$3,964,186	13	1.3%	44	1.9%	7	2.1%	3	1.4%
Mebane	8	0.2%	3	0.1%	7	0.2%	\$677,520	0	0.0%	17	0.1%	2	0.1%	1	0.1%
Ossipee	0	0.0%	0	0.0%	2	0.6%	\$5,000	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Swepsonville	5	0.7%	1	0.1%	9	1.4%	\$4,262,006	2	0.6%	12	1.1%	2	1.0%	1	1.4%
<i>Subtotal Alamance</i>	<i>460</i>	<i>0.7%</i>	<i>183</i>	<i>0.3%</i>	<i>504</i>	<i>0.6%</i>	<i>\$190,647,160</i>	<i>266</i>	<i>0.5%</i>	<i>944</i>	<i>0.6%</i>	<i>145</i>	<i>0.7%</i>	<i>61</i>	<i>0.6%</i>
Orange County (Unincorporated)	87	0.3%	37	0.1%	44	0.2%	\$7,530,250	24	0.2%	88	0.2%	10	0.2%	4	0.1%
Carrboro	44	0.8%	2	0.0%	56	1.0%	\$10,343,839	1	0.1%	127	0.6%	7	0.7%	7	0.6%
Chapel Hill	101	0.8%	17	0.1%	86	0.6%	\$36,268,012	55	0.8%	155	0.3%	14	0.3%	6	0.3%
Hillsborough	8	0.3%	2	0.1%	7	0.2%	\$1,400,088	6	0.3%	7	0.1%	1	0.1%	1	0.1%
<i>Subtotal Orange</i>	<i>240</i>	<i>0.5%</i>	<i>58</i>	<i>0.1%</i>	<i>193</i>	<i>0.4%</i>	<i>\$55,542,189</i>	<i>86</i>	<i>0.4%</i>	<i>377</i>	<i>0.3%</i>	<i>32</i>	<i>0.2%</i>	<i>18</i>	<i>0.3%</i>
Durham County (Unincorporated)	137	0.6%	82	0.4%	43	0.2%	\$6,728,401	20	0.1%	71	0.2%	8	0.1%	5	0.2%
Durham	478	0.6%	97	0.1%	351	0.4%	\$66,955,672	122	0.3%	821	0.4%	72	0.4%	63	0.4%
<i>Subtotal Durham</i>	<i>615</i>	<i>0.6%</i>	<i>179</i>	<i>0.2%</i>	<i>394</i>	<i>0.4%</i>	<i>\$44,603,175</i>	<i>142</i>	<i>0.3%</i>	<i>892</i>	<i>0.3%</i>	<i>80</i>	<i>0.3%</i>	<i>68</i>	<i>0.3%</i>
TOTAL ENO-HAW	1,315	0.6%	420	0.2%	1,091	0.5%	\$319,873,422	494	0.4%	2,213	0.4%	257	0.4%	147	0.4%

Source: GIS Analysis

Table 4.13: Numbers of Critical Facilities Exposed to the 1-Percent-Annual-Chance (100-year) Flood

Jurisdiction	EOCs	Fire Stations	Hospitals	Police Stations	Schools	Senior Care	Shelters
Alamance County (Unincorporated)	0	0	0	0	0	0	0
Alamance	0	0	0	0	0	0	0
Burlington	0	0	0	0	0	0	0
Elon	0	0	0	0	0	0	0
Graham	0	0	0	0	0	0	0
Green Level	0	0	0	0	0	0	0
Haw River	0	0	0	0	0	0	0
Mebane	0	0	0	0	0	0	0
Ossipee	0	0	0	0	0	0	0
Swepsonville	0	0	0	0	0	0	0
<i>Subtotal Alamance</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
Orange County (Unincorporated)	0	0	0	0	0	0	0
Carrboro	0	0	0	0	0	0	0
Chapel Hill	0	0	0	0	0	0	0
Hillsborough	0	0	0	0	0	0	0
<i>Subtotal Orange</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
Durham County (Unincorporated)	0	0	0	0	0	0	0
Durham	0	1	0	0	1	0	1
<i>Subtotal Durham</i>	<i>0</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>0</i>	<i>1</i>
TOTAL ENO-HAW	0	1	0	0	1	0	1

Source: FEMA DFIRM data; iRISK; NC OneMap.

Table 4.14: Numbers of Critical Facilities Exposed to the 0.2-Percent-Annual-Chance (500-year) Flood

Jurisdiction	EOCs	Fire Stations	Hospitals	Police Stations	Schools	Senior Care	Shelters
Alamance County (Unincorporated)	0	0	0	0	0	0	0
Alamance	0	0	0	0	0	0	0
Burlington	0	0	0	0	0	0	0
Elon	0	0	0	0	0	0	0
Graham	0	0	0	0	0	0	0
Green Level	0	0	0	0	0	0	0
Haw River	0	0	0	0	0	0	0
Mebane	0	0	0	0	0	0	0
Ossipee	0	0	0	0	0	0	0
Swepsonville	0	0	0	0	0	0	0
<i>Subtotal Alamance</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
Orange County (Unincorporated)	0	0	0	0	0	0	0
Carrboro	0	0	0	0	0	0	0
Chapel Hill	0	0	1	0	0	0	0
Hillsborough	0	0	0	0	0	0	0
<i>Subtotal Orange</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
Durham County (Unincorporated)	0	0	0	0	0	0	0
Durham	0	0	0	0	0	0	0
<i>Subtotal Durham</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
TOTAL ENO-HAW	0	0	1	0	0	0	0

Source: FEMA DFIRM data; iRISK; NC OneMap.

Table 4.15: Numbers of High Potential Loss Properties Exposed to the Flood Hazard

Jurisdiction	Airports		>\$1m	
	1%	0.2%	1%	0.2%
Alamance County (Unincorporated)	0	0	13	5
Alamance	0	0	0	0
Burlington	0	0	7	5
Elon	0	0	0	3
Graham	0	0	4	5
Green Level	0	0	0	0
Haw River	0	0	2	1
Mebane	0	0	0	0
Ossipee	0	0	0	0
Sweepsonville	0	0	0	1
<i>Subtotal Alamance</i>	<i>0</i>	<i>0</i>	<i>26</i>	<i>20</i>
Orange County (Unincorporated)	0	0	2	0
Carrboro	0	0	1	0
Chapel Hill	0	0	38	5
Hillsborough	0	0	1	0
<i>Subtotal Orange</i>	<i>0</i>	<i>0</i>	<i>42</i>	<i>5</i>
Durham County (Unincorporated)	0	0	20	1
Durham	0	0	59	22
<i>Subtotal Durham</i>	<i>0</i>	<i>0</i>	<i>79</i>	<i>23</i>
TOTAL ENO-HAW	0	0	147	48

Source: GIS analysis.

Table 4.16 provides a summary count by jurisdiction of Repetitive Loss (RL) properties and associated losses as identified by FEMA through the NFIP.

Table 4.16: Numbers of Repetitive Loss (RL) Properties and Losses by Jurisdiction

Jurisdiction	Total Number of RL Properties	Total Number of RL Losses	Total Amount of Claims Payments
Alamance County (Unincorporated)	5	11	\$234,162
Alamance	0	0	\$0
Burlington	3	11	\$179,966
Elon	0	0	\$0
Graham	0	0	\$0
Green Level	0	0	\$0
Haw River	0	0	\$0
Mebane	0	0	\$0
Ossipee	0	0	\$0
Swepsonville	0	0	\$0
<i>Subtotal Alamance</i>	<i>8</i>	<i>22</i>	<i>\$414,128</i>
Orange County (Unincorporated)	0	0	\$0
Carrboro	0	0	\$0
Chapel Hill	18	63	\$3,799,140
Hillsborough	0	0	\$0
<i>Subtotal Orange</i>	<i>18</i>	<i>63</i>	<i>\$3,799,140</i>
Durham County (Unincorporated)	1	2	\$17,955
Durham	20	50	\$640,252
<i>Subtotal Durham</i>	<i>21</i>	<i>52</i>	<i>\$658,207</i>
TOTAL ENO-HAW	47	137	\$4,871,475

Source: Federal Emergency Management Agency National Flood Insurance Program, January 2015.

All of the RL properties identified above are residential with the exception of one non-residential building located in the Town of Chapel Hill.

4.5.1.3 Dam/Levee Failure

Dam/Levee Failure Hazard Description

Dam/levee failure is the breakdown, collapse, or other failure of a dam or levee structure characterized by the uncontrolled release of impounded water that results in downstream flooding. In the event of a dam or levee failure, the energy of the water stored behind even a small structure is capable of causing loss of life and severe property damage if development exists downstream. There are varying degrees of failure, and an unexpected or unplanned breach is considered one type of failure. A breach is an opening through a dam or levee which drains the water impounded behind it. A controlled breach is a planned, constructed opening and not considered a failure event, while an uncontrolled breach is the unintentional discharge from the impounded water body and considered a failure.

Dam/levee failure can result from natural events, human-caused events, or a combination of the two. Natural occurrences that may cause dam or levee failure include hurricanes, floods, earthquakes, and landslides; human-caused actions may include the deterioration of the foundation or the materials used in construction. In recent years, dams have also received considerably more attention in the emergency management community as potential targets for terrorist acts.

Dam/levee failure presents a significant potential for disaster, in that significant loss of life and property would be expected in addition to the possible loss of power and water resources. The most common cause of failure is prolonged rainfall that produces flooding. Failures due to other natural events such as hurricanes, earthquakes, or landslides are significant because there is generally little or no advance warning. The best way to mitigate dam or levee failure is through the proper construction, inspection, maintenance, and operation of these structures, as well as maintaining and updating Emergency Action Plans (EAPs) for use in the event of a dam failure.

Dam/Levee Failure Hazard Analysis

Dam failure analysis in the state of North Carolina has inherent limitations. Typically, the structures that have the greatest potential for damage and loss of life, and that have the best data available for flood inundation mapping, are the least likely to fail and are of least concern to local mitigation planning teams. It is often times the smaller, unmapped, unregulated, non-inventoried dams that cause the most problems when they fail.

Location Within the Planning Area

Table 4.17 shows counts of high and intermediate hazard dams in each participating jurisdiction. In total there are 50 high hazard dams in the planning area and 35 intermediate hazard dams. **Figure 4.17** shows the locations of all state-regulated dams in and immediately around the planning area. The majority of high and intermediate hazard dams in Alamance and Orange counties are in unincorporated areas of the county. The majority of high and intermediate hazard dams in Durham County are in the City of Durham.

Table 4.17: Counts of High Hazard and Intermediate Hazard Dams by Jurisdiction

Jurisdiction	High	Intermediate
Alamance County (Unincorporated)	7	7
Alamance	0	0
Burlington	4	0
Elon	1	1
Graham	0	0
Green Level	0	0
Haw River	0	0
Mebane	1	1
Ossipee	0	0
Sweepsonville	0	0
<i>Subtotal Alamance</i>	<i>13</i>	<i>9</i>
Orange County (Unincorporated)	7	6
Carrboro	2	1
Chapel Hill	3	1
Hillsborough	1	1
<i>Subtotal Orange</i>	<i>13</i>	<i>9</i>
Durham County (Unincorporated)	6	6
Durham	18	11
<i>Subtotal Durham</i>	<i>24</i>	<i>17</i>
TOTAL ENO-HAW	50	35

Source: North Carolina Dams Program, North Carolina Department of Environment and Natural Resources (NCDENR).

Extent (Magnitude and Severity)

Two factors influence the potential severity of a dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream. The potential extent of dam failure may be classified according to their “hazard potential,” meaning the probable damage that would occur *if* the structure failed, in terms of loss of human life and economic loss or environmental damage. The State of North Carolina classifies dam structures under its regulations according to hazard potential as described in **Table 4.18**. It is important to note that these classifications are not based on the adequacy or structural integrity of existing dam structures.

Table 4.18: Classification of Hazard Potential for North Carolina Dams

Hazard Classification	Description	Quantitative Guidelines
Low	1) Interruption of road service, low volume roads 2) Economic damage	1) Less than 25 vehicles per day 2) Less than \$30,000
Intermediate	1) Damage to highways, interruption of service 2) Economic damage	1) 25 to less than 250 vehicles per day 2) \$30,000 to less than \$200,000
High	1) Probable loss of human life due to breached roadway or bridge on or below the dam 2) Economic damage	1) Probable loss of 1 or more human lives 2) More than \$200,000

Source: North Carolina Dams Program, North Carolina Department of Environment and Natural Resources (NCDENR).

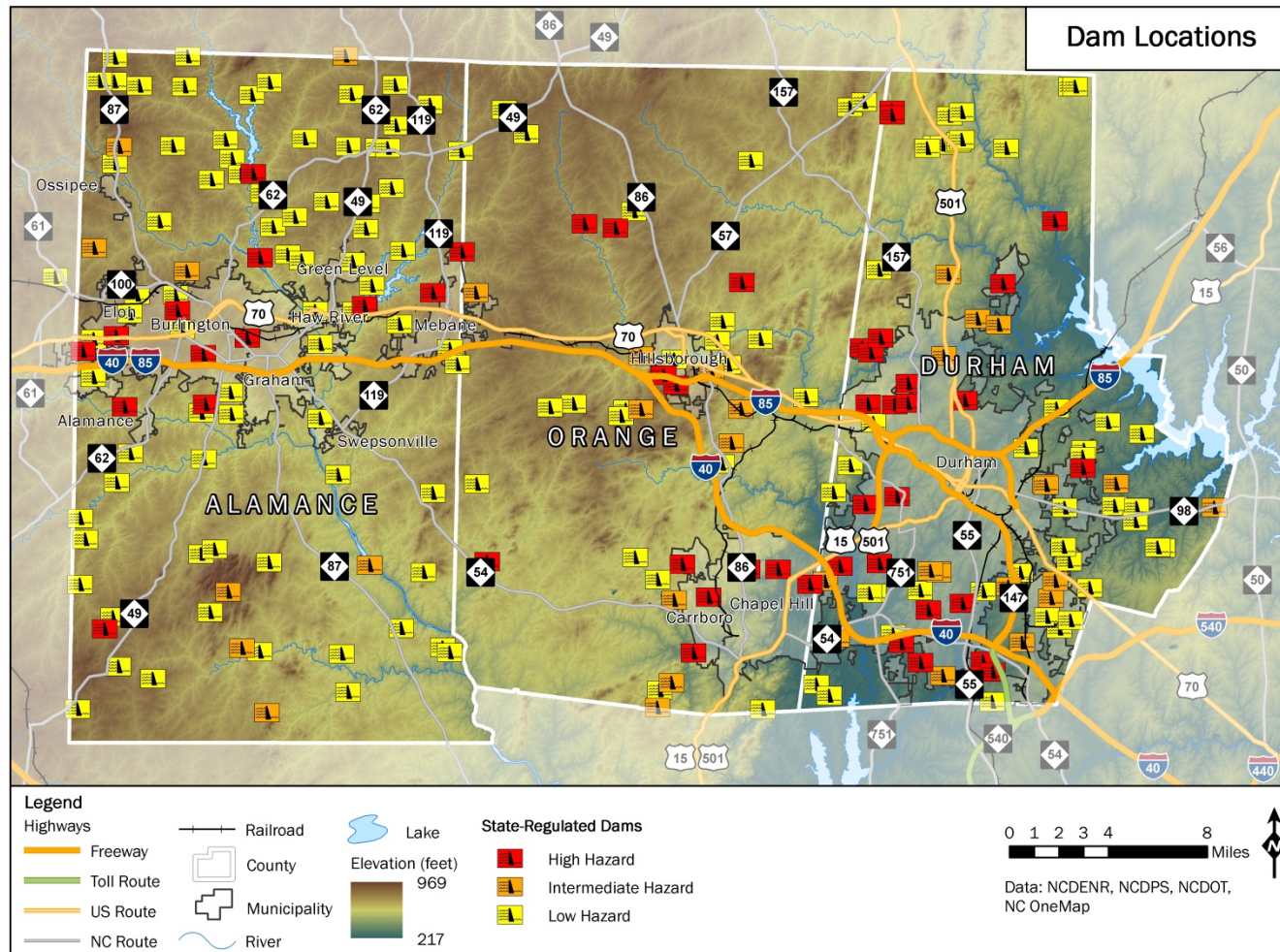
Historical Occurrences

There are no records of historical dam failure occurrences in or affecting the planning area.

Probability of Future Occurrences

The probability of a dam failure occurrence at a large dam structure, such as ones owned by Duke Energy Corporation in other parts of North Carolina, is considered to be unlikely due to safe guards, maintenance schedules, plans, and other regulatory devices. The probability of occurrence at smaller, privately owned dam structures is much more likely; however, data is not currently available for these smaller structures, both in terms of point locations and mapped inundation areas.

Figure 4.17: Locations of State-Regulated Dams



Dam/Levee Failure Hazard Vulnerability

The following tables provide counts and values by jurisdiction relevant to potential dam failure exposure in the Eno-Haw Region.

Table 4.19: Exposure to High Hazard Dam Failure Inundation Areas

Jurisdiction	Number of Developed Parcels At Risk		Number of Undeveloped Parcels At Risk		Number of Buildings At Risk		Value of Buildings At Risk	Population At Risk		Elderly Population At Risk		Children At Risk	
	Num	Per	Num	Per	Num	Per		Num	Per	Num	Per	Num	Per
Alamance County (Unincorporated)	12	0.0%	9	0.0%	2	0.0%	\$69,945	2	0.0%	0	0.0	0	0.0%
Alamance	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0	0	0.0%
Burlington	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0	0	0.0%
Elon	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0	0	0.0%
Graham	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0	0	0.0%
Green Level	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0	0	0.0%
Haw River	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0	0	0.0%
Mebane	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0	0	0.0%
Ossipee	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0	0	0.0%
Swepsonville	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0	0	0.0%
<i>Subtotal Alamance</i>	<i>12</i>	<i>0.0%</i>	<i>9</i>	<i>0.0%</i>	<i>2</i>	<i>0.0%</i>	<i>\$69,945</i>	<i>2</i>	<i>0.0%</i>	<i>0</i>	<i>0.0</i>	<i>0</i>	<i>0.0%</i>
Orange County (Unincorporated)	36	0.1%	40	0.1%	4	0.0%	\$384,608	10	0.0%	1	0.0	0	0.0%
Carrboro	16	0.3%	12	0.2%	0	0.0%	\$0	0	0.0%	0	0.0	0	0.0%
Chapel Hill	172	1.3%	31	0.2%	54	0.4%	\$13,536,183	124	0.2%	11	0.2	5	0.2%
Hillsborough	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0	0	0.0%
<i>Subtotal Orange</i>	<i>224</i>	<i>0.5%</i>	<i>83</i>	<i>0.2%</i>	<i>58</i>	<i>0.1%</i>	<i>\$13,920,791</i>	<i>134</i>	<i>0.1%</i>	<i>12</i>	<i>0.1</i>	<i>5</i>	<i>0.1%</i>
Durham County (Unincorporated)	84	0.4%	75	0.3%	9	0.0%	\$1,306,496	17	0.0%	2	0.0	1	0.1%
Durham	96	0.1%	14	0.0%	26	0.0%	\$2,646,422	56	0.0%	5	0.0	4	0.0%
<i>Subtotal Durham</i>	<i>180</i>	<i>0.2%</i>	<i>89</i>	<i>0.1%</i>	<i>35</i>	<i>0.0%</i>	<i>\$3,952,918</i>	<i>73</i>	<i>0.0%</i>	<i>7</i>	<i>0.0</i>	<i>5</i>	<i>0.0%</i>
TOTAL ENO-HAW	416	0.2%	181	0.1%	95	0.0%	\$17,943,654	209	0.0%	20	0.0	10	0.0%

Table 4.20: Exposure to Intermediate Hazard Dam Failure Inundation Areas

Jurisdiction	Number of Developed Parcels At Risk		Number of Undeveloped Parcels At Risk		Number of Buildings At Risk		Value of Buildings At Risk	Population At Risk		Elderly Population At Risk		Children At Risk	
	Num	Per	Num	Per	Num	Per		Num	Per	Num	Per	Num	Per
Alamance County (Unincorporated)	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
Alamance	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
Burlington	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
Elon	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
Graham	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
Green Level	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
Haw River	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
Mebane	2	0.0%	3	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
Ossipee	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
Swepsonville	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
<i>Subtotal Alamance</i>	<i>2</i>	<i>0.0%</i>	<i>3</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>	<i>\$0</i>	<i>0</i>	<i>0.0</i>	<i>0</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>
Orange County (Unincorporated)	4	0.0%	2	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
Carrboro	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
Chapel Hill	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
Hillsborough	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0	0	0.0%	0	0.0%
<i>Subtotal Orange</i>	<i>4</i>	<i>0.0%</i>	<i>2</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>	<i>\$0</i>	<i>0</i>	<i>0.0</i>	<i>0</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>
Durham County (Unincorporated)	13	0.1%	18	0.1%	1	0.0%	\$21,661	2	0.0	0	0.0%	0	0.0%
Durham	8	0.0%	11	0.0%	1	0.0%	\$264,793	2	0.0	0	0.0%	0	0.0%
<i>Subtotal Durham</i>	<i>21</i>	<i>0.0%</i>	<i>29</i>	<i>0.0%</i>	<i>2</i>	<i>0.0%</i>	<i>\$287,454</i>	<i>4</i>	<i>0.0</i>	<i>0</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>
TOTAL ENO-HAW	27	0.0%	34	0.0%	2	0.0%	\$287,454	4	0.0	0	0.0%	0	0.0%

4.5.1.4 Drought/Extreme Heat

Drought/Extreme Heat Hazard Description

Drought is a natural climatic condition caused by an extended period of limited rainfall beyond that which occurs naturally in a broad geographic area. High temperatures, high winds, and low humidity can worsen drought conditions, and can make areas more susceptible to wildfire. Human demands and actions can also hasten drought-related impacts.

Droughts are frequently classified as one of the following four types: meteorological, agricultural, hydrological, or socio-economic. Meteorological droughts are typically defined by the level of “dryness” when compared to an average, or normal amount of precipitation over a given period of time. Agricultural droughts relate common characteristics of drought to their specific agricultural-related impacts (when the amount of moisture in soil does not meet the needs of a particular crop). Hydrological drought is directly related to the effect of precipitation shortfalls on surface and groundwater supplies. Human factors, particularly changes in land use, can alter the hydrologic characteristics of a basin. Socio-economic drought is the result of water shortages that affect people and limit the ability to supply water-dependent products in the marketplace.

Drought conditions typically do not cause property damage or threaten lives, but rather drought effects are most directly felt by agricultural sectors. At times, drought may also cause community-wide impacts as a result of acute water shortages (regulatory use restrictions, drinking water supply, and salt water intrusion). The magnitude of such impacts correlates directly with local groundwater supplies, reservoir storage, and development densities. Drought conditions can also contribute to or exacerbate extreme heat concerns, particularly with regard to elderly populations.

Drought/Extreme Heat Hazard Analysis

One of the most significant droughts in recent North Carolina history occurred in 2007-2008. According to the NC Drought Management Advisory Council, the drought of 2007-2008 was the most severe in this state over the past 100 years of modern records, based on numerous drought indicators that have been recorded in the state since the 19th century. Therefore it is known that serious droughts can occur in the state, but not all droughts are expected to be as severe as the 2007-2008 drought.

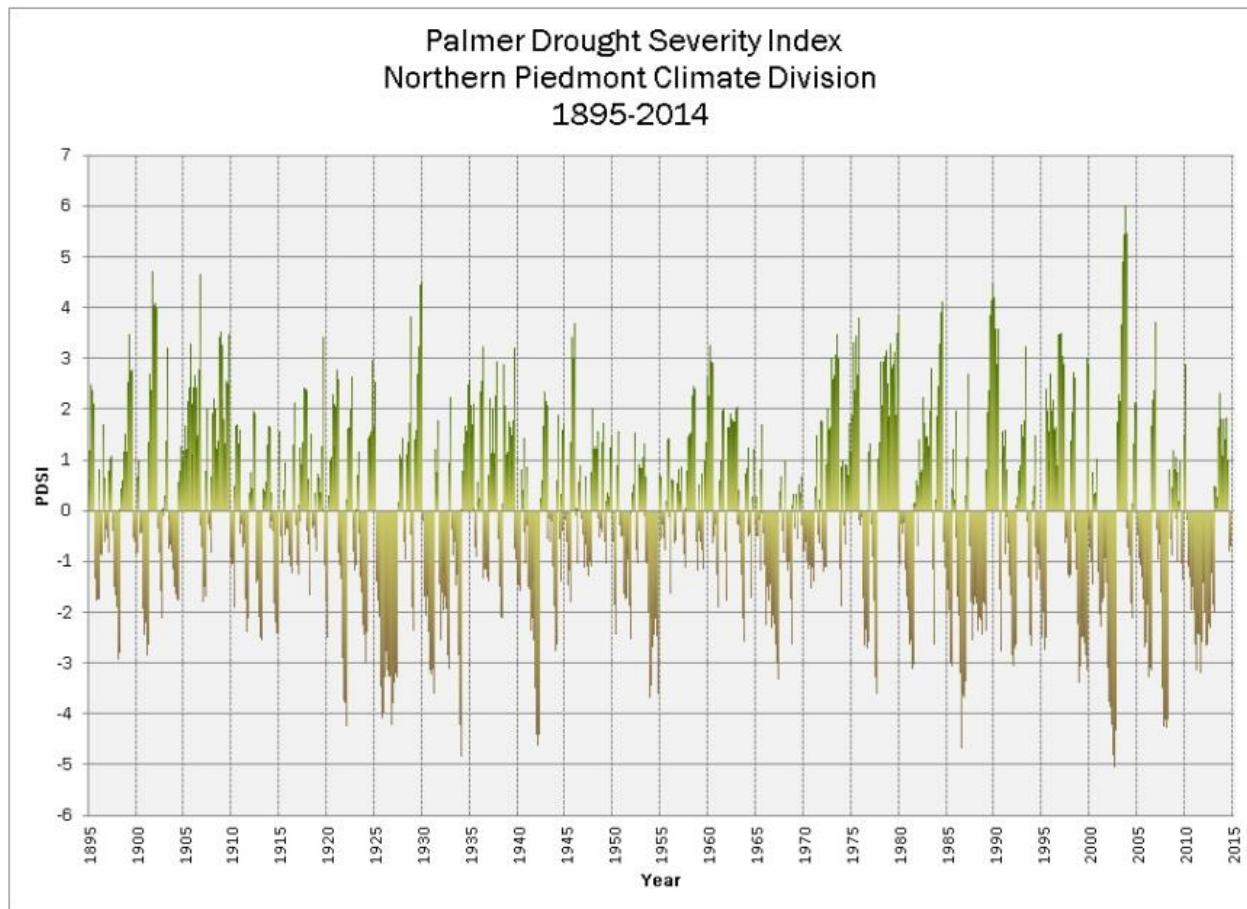
Location Within the Planning Area

Typically the National Weather Service looks at drought and extreme heat as episodes that impact a widespread forecast “zone,” and therefore it is not common to pinpoint a specific location within a planning area that is more susceptible to these hazards than others. From this viewpoint, each county is considered uniformly at risk to drought and extreme heat. However, the most significant financial losses are likely to occur in areas that are primarily agricultural.

Extent (Magnitude and Severity)

As supported by the historical occurrences presented in the following subsection, the magnitude and severity of the drought/extreme heat hazard in the planning area is considered to be relatively mild. No deaths, injuries, property damages, or crop damages have been reported according to NCDC since 1998 so it is difficult to assign any specific severity rating to this hazard. **Figure 4.18** shows the Palmer Drought Severity Index (PDSI) for the Northern Piedmont Climate Division for from 1895 through 2014, which is an indication of periodic highs and lows for drought conditions.

Figure 4.18: Palmer Drought Severity Index for the Northern Piedmont Climate Division



Source: National Oceanic and Atmospheric Administration

Historical Occurrences

Despite the fact that portions of the state have been impacted by more than 500 drought events over the past 65 years, NCDC does not attribute any specific drought events to Alamance, Orange, or Durham counties since 1950.

Probability of Future Occurrences

Based on the fact that the state as a whole is known to have experienced a large number of historical drought occurrences in the past 65 years (more than 500), it is likely that the Eno-Haw Region will continue to experience periods of drought to some extent whether officially recorded or not officially recorded. It is considered to be unlikely however that the Region will experience extreme conditions that would result in deaths, injuries, or significant property damage. Even though historical records are not available that point to specific amounts of historical crop losses, it is assumed that drought events have the potential to adversely affect the agricultural economy of the Eno-Haw Region.

Drought/Extreme Heat Hazard Vulnerability

All of the inventoried assets in the Eno-Haw Region are technically exposed to the drought/extreme heat hazard. However, it is not possible through GIS or anecdotal methods to determine specific numbers and values of individual assets that are more vulnerable to this hazard, especially in terms

of the built environment. Further, all crops and other natural assets are considered to be equally at risk based on the data available and therefore no specific breakdown of these types of assets is possible. Any anticipated future damages or losses are expected to be minimal based on historical occurrences and other factors as described above.

4.5.2 Atmospheric Hazards (Severe Storms)

Atmospheric hazards generally have their own individual characteristics, geographic areas that may be affected, time of year they are most likely to occur, severity, and associated risk. Atmospheric hazards include thunderstorm, lightning, and hail; tornado; winter weather; and hurricane and tropical storm. In many cases, a natural hazard event involving atmospheric hazards involves more than one individual atmospheric hazard. For example, severe thunderstorms can produce lightning, hail, tornadoes, and damaging winds. Atmospheric hazards are presented separately from other categories of hazards but they may be interrelated. For example, severe thunderstorms can produce flooding, and other extreme weather events can lead to problems with dams and levees, cause landslides, etc.

4.5.2.1 Thunderstorm, Lightning, and Hail

Thunderstorm, Lightning, and Hail Hazard Description

Thunderstorms are caused when air masses of varying temperatures meet. Rapidly rising warm moist air serves as the “engine” for thunderstorms. These storms can occur singularly, in lines, or in clusters. They can move through an area very quickly or linger for several hours. According to the National Weather Service, more than 100,000 thunderstorms occur each year, though only about 10% of these storms are classified as “severe.” Although thunderstorms generally affect a small area when they occur, they can be very dangerous because of their ability to generate tornadoes, hailstorms, strong winds, flash flooding, and damaging lightning. While thunderstorms can occur in all regions of the United States, they are most common in the central and southern states because atmospheric conditions in those regions are most ideal for generating these powerful storms.

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a “bolt” when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder. On average, 73 people are killed each year by lightning strikes in the United States.

Hail is a product of thunderstorms or intense showers. Hail is generally white and translucent, consisting of liquid or snow particles encased with layers of ice. Hail is formed within the high portion of a well-organized thunderstorm. When hailstones become too heavy to be caught in an updraft and carried back into the clouds of a thunderstorm (hailstones can be caught in numerous updrafts, adding a coating of ice to the original frozen droplets each time), they then fall as hail, and a hailstorm occurs.

Thunderstorm, Lightning, and Hail Hazard Analysis

Thunderstorms are common throughout the state of North Carolina, and have been known to occur during all calendar months. In terms of thunderstorm winds, the planning area is in a fairly uniform

region with regard to 100-year winds. Wind speeds during a 100-year thunderstorm event are expected to be around 90 miles per hour throughout the three-county area (**Figure 4.19**). However, some differences do become apparent when looking at the 700-year return period (**Figures 4.20 through 4.22**). During a 700-year wind event, the majority of the planning area would be expected to experience winds around 100 miles per hour with a large portion of Durham County experiencing winds up to 105 miles per hour and a small portion of Alamance County dropping to around 95 miles per hour.

Figure 4.19: Regional Thunderstorm Wind Hazard Map Showing the 100-year Return Period

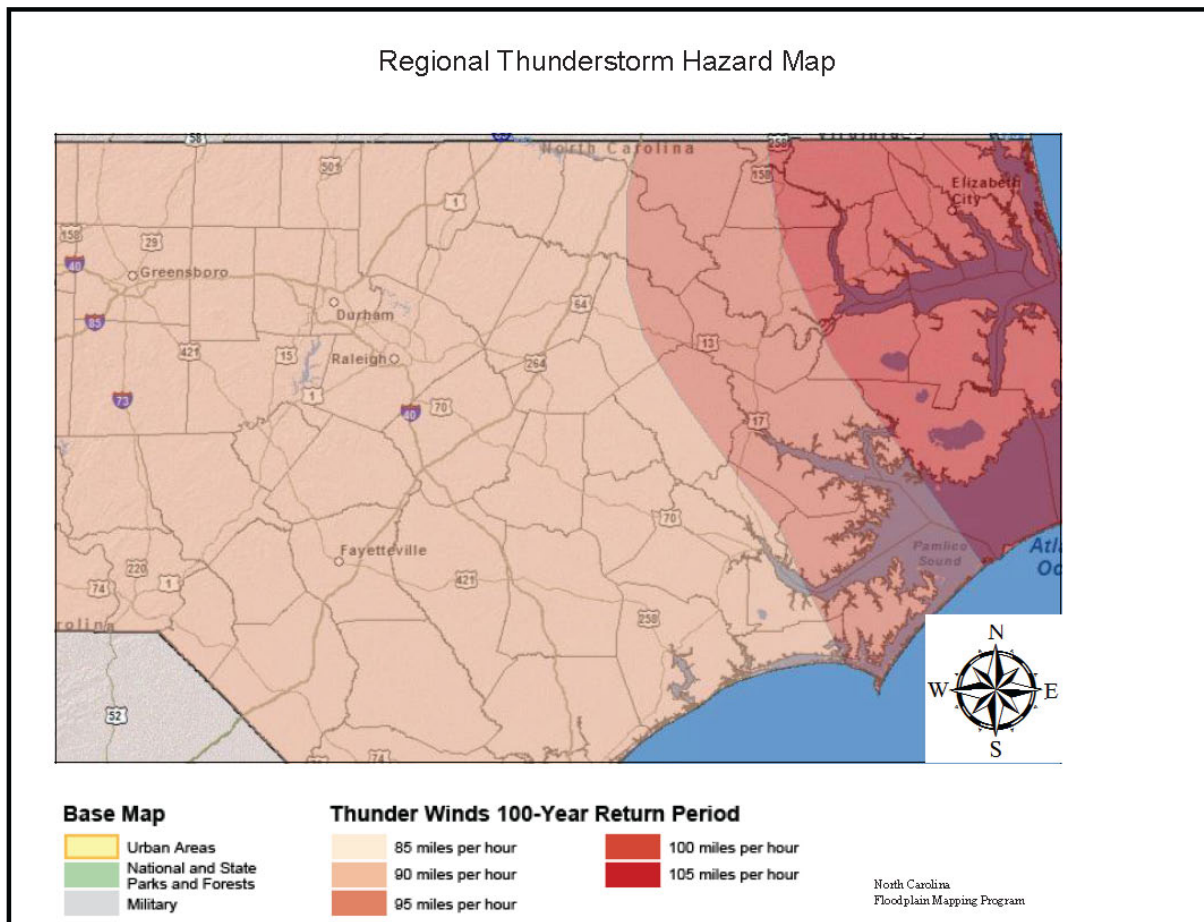


Figure 4.20: Alamance County Thunderstorm Wind Hazard Map (700-year Return Period)

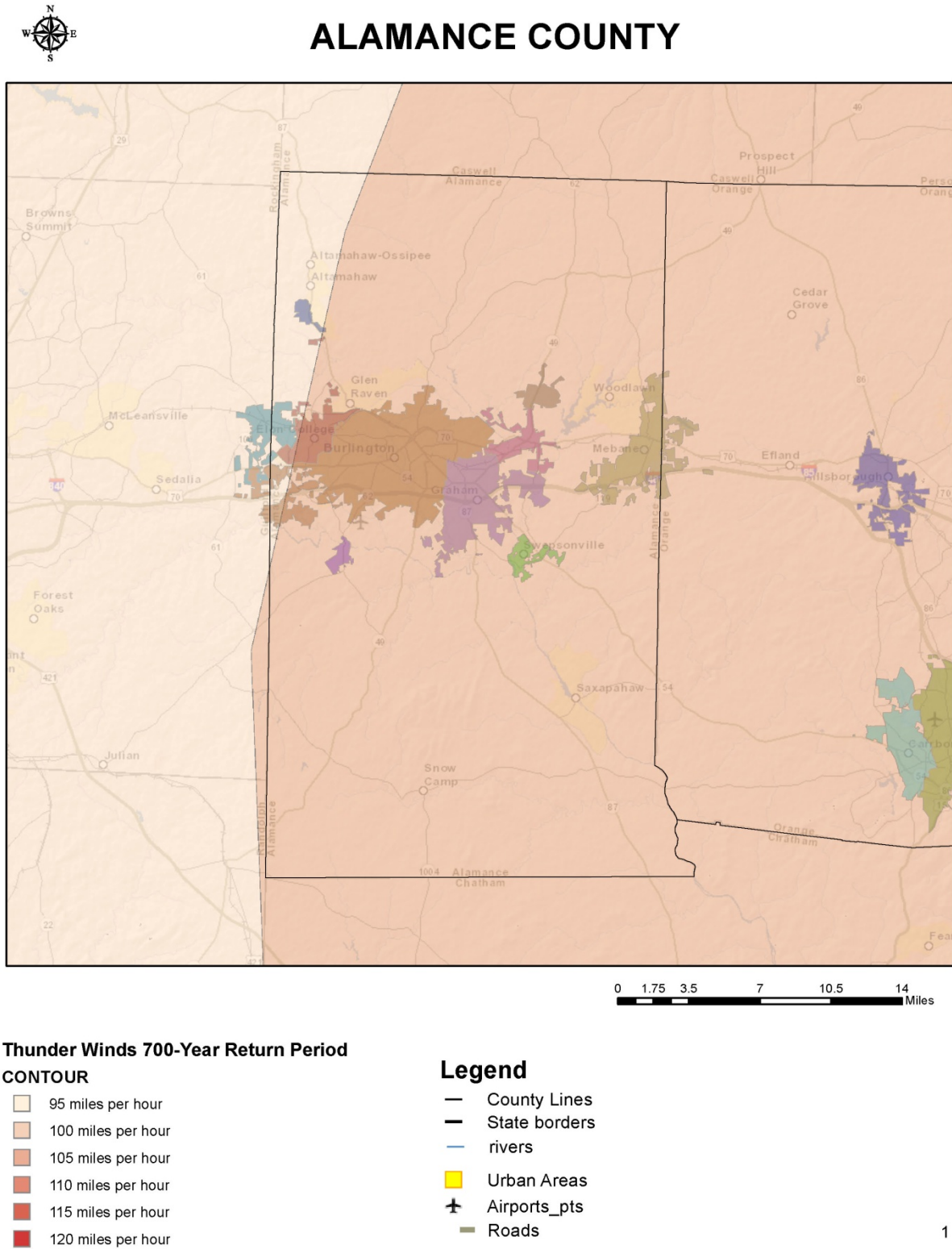


Figure 4.21: Orange County Thunderstorm Wind Hazard Map (700-year Return Period)

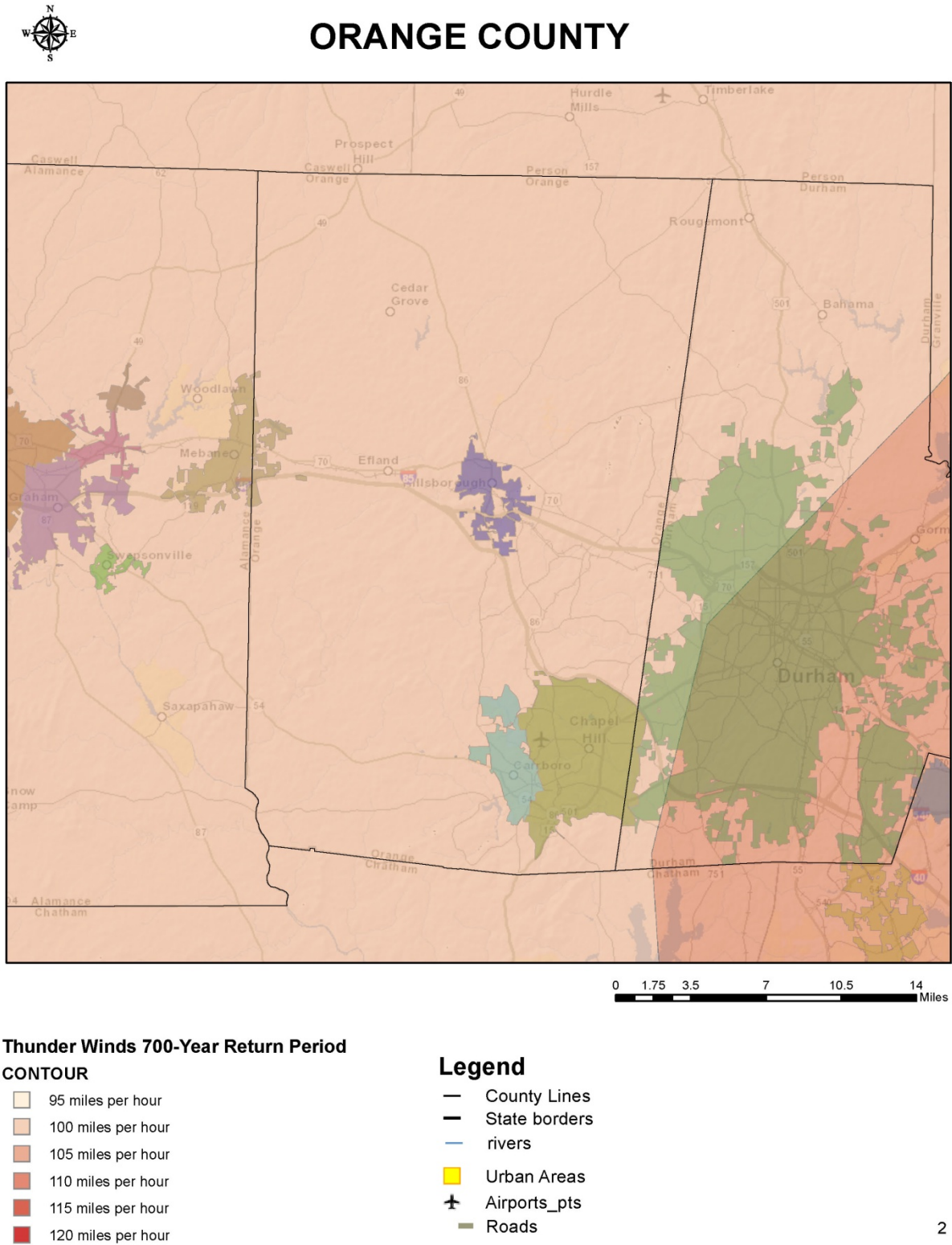
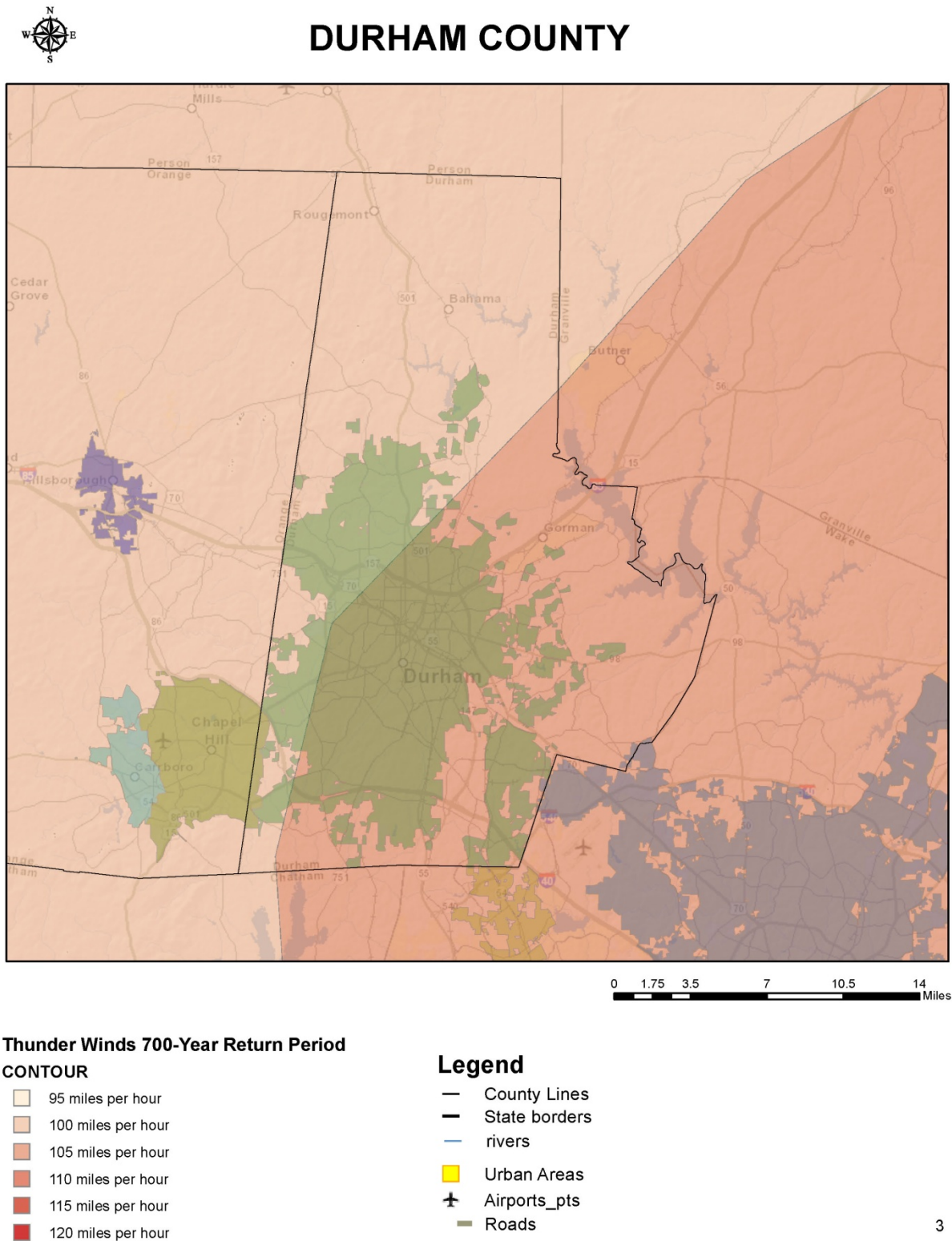


Figure 4.22: Durham County Thunderstorm Wind Hazard Map (700-year Return Period)



Location Within the Planning Area

Thunderstorms, including lightning and hail, are widespread atmospheric disturbances that are not isolated to a specific geographic location. Therefore it is assumed that the entire planning area is exposed to these hazards, with some variation in wind speeds as depicted in the maps on the preceding pages. It is also possible to map historic average annual cloud-to-ground lightning strikes and historic hail reportings by diameter as an indication of where in the Eno-Haw Region these hazards have previously been observed and to what degree (**Figure 4.23**).

Extent (Magnitude and Severity)

Thunderstorms, lightning, and hail are known to be damaging hazard occurrences in the Eno-Haw Region that can result in multiple injuries. There is currently no specific overall scale to rank the potential severity of severe events of this type but it is assumed that the magnitude and severity of future occurrences will be similar to that of historical occurrences.

The highest recorded thunderstorm winds in Alamance County (according to NCDC) were 70 knots, recorded in Burlington and in Haw River on May 25, 2000. The highest recorded thunderstorm winds in Orange County were 69 knots, recorded in an unincorporated area of the county on April 26, 1986. The highest recorded thunderstorm winds in Durham County were 80 knots, recorded in an unincorporated area of the county on July 21, 1962. Therefore, based on historical data winds up to 80 knots can be expected in the planning area.

The largest recorded size of a hailstone in Alamance County (according to NCDC) is 2.5 inches reported in Altamahaw on May 1, 1998. The largest recorded size of a hailstone in Orange County (according to NCDC) is 2.75 inches reported in an unincorporated area of the county on May 14, 1967. The largest recorded size of a hailstone in Durham County (according to NCDC) is 2.75 inches reported in an unincorporated area of the county on April 24, 1955. Therefore, based on historical data hailstones up to 2.75 inches can be expected in the planning area.

There are some national studies that suggest that the risk of severe thunderstorms that produce torrential rain, damaging winds, large hail, and tornadoes may increase due to changes in the climate. However, there is currently no evidence to suggest at what rate this may occur within the Eno-Haw Region.

Historical Occurrences

The following historical occurrences ranging from 1950 to the present have been identified based on the NCDC Storm Events database (**Table 4.21**). It should be noted that only historical occurrences listed in the NCDC database are shown here and that other, unrecorded or unreported events may have occurred within the planning area during this timeframe.

Table 4.21: Summary of Historical Thunderstorm, Lightning, and Hail Occurrences by Participating Jurisdiction (1950 through October 2014)

Jurisdiction	Number of Thunderstorm High Wind Events	Number of Lightning Events	Number of Hail Events	Deaths	Injuries	Reported Property Damage	Reported Crop Damage
Alamance County (Unincorporated)	78	2	37	0	3	343,000	150,000
Alamance	3	0	3	0	0	0	0
Burlington	13	1	11	0	0	85,000	0
Elon	11	0	3	0	0	333,000	0
Graham	7	2	10	0	0	4,000	0
Green Level	0	0	0	0	0	0	0
Haw River	3	0	4	0	0	0	0
Mebane	15	2	5	0	0	125,000	0
Ossipee	0	0	0	0	0	0	0
Sweepsonville	11	0	4	0	0	1,000	0
<i>Subtotal Alamance</i>	141	7	77	0	3	891,000	150,000
Orange County (Unincorporated)	101	2	46	0	0	73,500	0
Carrboro	2	1	2	0	0	15,000	0
Chapel Hill	27	2	9	1	2	2,465,500	0
Hillsborough	18	2	13	0	1	81,500	0
<i>Subtotal Orange</i>	148	7	70	1	3	250,500	0
Durham County (Unincorporated)	109	4	12	2	2	448,000	0
Durham	46	3	4	0	0	193,750	0
<i>Subtotal Durham</i>	155	7	16	2	2	488,750	0
TOTAL ENO-HAW	444	21	163	3	8	1,630,250	150,000

Source: National Climatic Data Center Storm Events Database

According to NCDC, 444 recorded instances of thunderstorm, lightning, and hail conditions have affected the planning area since 1950, causing an estimated \$1,630,250 in property damages, \$150,000 in crop damages, 3 deaths, and 8 reported injuries.

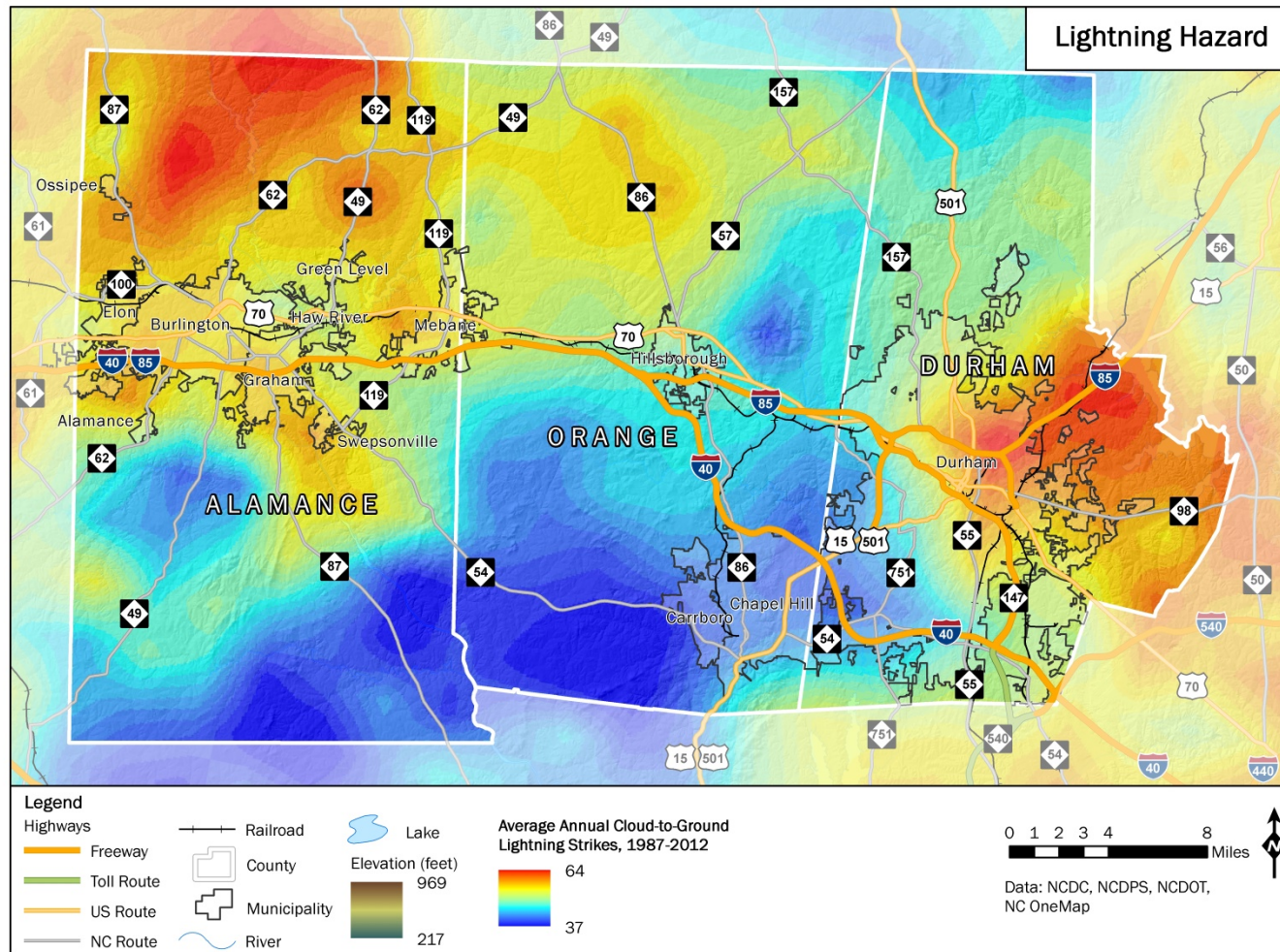
Probability of Future Occurrences

The probability of future occurrences of thunderstorm, lightning, and hail events is considered to be highly likely based on historical occurrences. There are some national studies that suggest that the frequency of severe thunderstorms that produce torrential rain, damaging winds, large hail, and tornadoes may increase due to changes in the climate. However, there is currently no evidence to suggest at what rate this may occur within the Eno-Haw Region.

Thunderstorm, Lightning, and Hail Hazard Vulnerability

All of the inventoried assets in the Eno-Haw Region are exposed to thunderstorm, lightning, and hail. Any specific vulnerabilities of individual assets depend greatly on individual design, building characteristics, and any existing mitigation measures currently in place. Such site-specific vulnerability determinations are outside the scope of this risk assessment but may be considered during future plan updates.

Figure 4.23: Historic Lightning Observations in the Eno-Haw Region



4.5.2.2 Tornado

Tornado Hazard Description

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes and other tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 to more than 300 mph. The most violent tornadoes have rotating winds of 250 mph or more, and are capable of causing extreme destruction and turning normally harmless objects into deadly missiles.

The damage caused by tornadoes ranges from gale force to “incredible,” depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction such as residential homes (particularly mobile homes). **Table 4.22** shows the Enhanced Fujita Scale for Tornado Damage⁹ which was implemented in 2007 to replace the original Fujita Scale and to more accurately measure tornado strength and associated damages.

Table 4.22: Enhanced Fujita Scale for Tornado Damage

Storm Category	Damage Level	3 Second Gust (mph)	Description of Damages
EF0	Gale	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	Weak	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages might be destroyed.
EF2	Strong	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	Severe	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	Devastating	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	Incredible	200+	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

Source: National Oceanic and Atmospheric Administration, Federal Emergency Management Agency

The original Fujita Tornado Damage Scale¹⁰ is not shown here in order to avoid confusion. However, it is worth noting that tornado events that occurred prior to 2007 may be referenced by

⁹ The Enhanced Fujita Scale for Tornado Damage can be accessed online at <http://www.spc.noaa.gov/faq/tornado/ef-scale.html>.

¹⁰ The original Fujita Tornado Damage Scale can be accessed online at <http://www.spc.noaa.gov/faq/tornado/f-scale.html>.

the original F-Scale numbers and associated damages may differ to some extent from those presented above.

Each year, an average of more than 800 tornadoes is reported nationwide, resulting in an average of 80 deaths and 1,500 injuries. They are more likely to occur during the months of March through May and can occur at any time of day, but are likely to form in the late afternoon and early evening. Most tornadoes are a few dozen yards wide and touch down briefly, but even small short-lived tornadoes can inflict tremendous damage. Highly destructive tornadoes might carve out a path over a mile wide and several miles long.

The tornadoes associated with tropical cyclones are most frequent in September and October when the incidence of tropical storm systems is greatest. This type of tornado usually occurs around the perimeter of the storm, and most often to the right and ahead of the storm path or the storm center as it comes ashore. These tornadoes commonly occur as part of large outbreaks and generally move in an easterly direction.

Tornado Hazard Analysis

When compared with other states, North Carolina ranks #22 in number of tornado events, #20 in tornado deaths, #17 in tornado injuries, and #21 in damages. These rankings are based upon data collected for all states and territories for tornado events between 1950 and 1994 (SPC, 2003). According to the State Climate Office of North Carolina, most tornado occurrences in North Carolina (43%) are minimal (EF0) in intensity, followed by EF1 (37%).

Location Within the Planning Area

Tornadoes are unpredictable manifestations and are not isolated to a specific geographic location. Therefore it is assumed that the entire planning area is exposed to this hazard. However, it is possible to map historic tornado point locations and damage paths as an indicator of where tornadoes are known to have occurred in the planning area in the past (**Figure 4.24**).

Extent (Magnitude and Severity)

Tornadoes of any magnitude and severity are possible within the planning area. Since 1951, the highest magnitude tornado to impact the Eno-Haw Region has been an F3 on the Fujita Scale for Tornado Damage which occurred November 23, 1992 (see *Historical Occurrences* subsection below).

Historical Occurrences

The following historical occurrences ranging from 1950 to the present have been identified based on the NCDC Storm Events Database (**Table 4.23**). It should be noted that only historical occurrences listed in the NCDC database are shown here and that other, unrecorded or unreported events may have occurred within the planning area during this timeframe.

Table 4.23: Historical Occurrences of Tornadoes (1950 through October 2014)

Location	Date	Magnitude	Deaths	Injuries	Reported Property Damage	Reported Crop Damage
ALAMANCE COUNTY						
Alamance County	3/19/1975	F1	0	1	\$25,000	\$0
Alamance County	7/21/1977	F1	0	0	\$250,000	\$0
Alamance County	5/26/1983	F1	0	0	\$25,000	\$0
Union Ridge	3/4/2008	EF0	0	0	\$150,000	\$0
Altamahaw	4/16/2011	EF1	0	0	\$580,000	\$0
<i>Subtotal Alamance</i>			0	1	\$1,030,000	\$0
ORANGE COUNTY						
Orange County	7/13/1975	F1	0	1	\$2,500	\$0
Orange County	3/29/1991	F2	0	0	\$0	\$0
Orange County	11/23/1992	F3	2	10	\$250,000	\$0
Orange County	1/28/1994	F0	0	0	\$0	\$0
Carrboro	6/19/2000	F0	0	0	\$0	\$0
Carrboro	9/8/2004	F0	0	0	\$0	\$0
Schley	1/14/2005	F0	0	0	\$0	\$0
Carrboro	10/27/2010	EF1	0	0	\$250,000	\$0
<i>Subtotal Orange</i>			2	11	\$502,500	\$0
DURHAM COUNTY						
Durham County	12/31/1975	F0	0	0	\$250	\$0
Durham County	4/4/1984	F2	0	4	\$2,500,000	\$0
Durham County	5/5/1989	F2	0	0	\$25,000,000	\$0
Durham County	7/16/1989	F1	0	0	\$25,000	\$0
Bahama	3/20/1998	F2	0	1	\$600,000	\$0
Gorman	5/14/2006	F0	0	0	\$0	\$0
Hope Valley	5/15/2014	EF1	0	0	\$250,000	\$0
<i>Subtotal Durham</i>			1	5	\$28,375,000	\$0
TOTAL ENO-HAW			3	17	\$29,907,500	\$0

Source: National Climatic Data Center Storm Events Database

According to the information provided in the preceding table, 20 recorded instances of tornadoes have affected the planning area since 1950, causing an estimated \$29,907,500 in property damage, \$0 in crop damages, 3 deaths, and 17 injuries. The highest magnitude tornado on record in the planning area is an F3 (11/23/1992 in Orange County). The lowest magnitude on record is an F0.

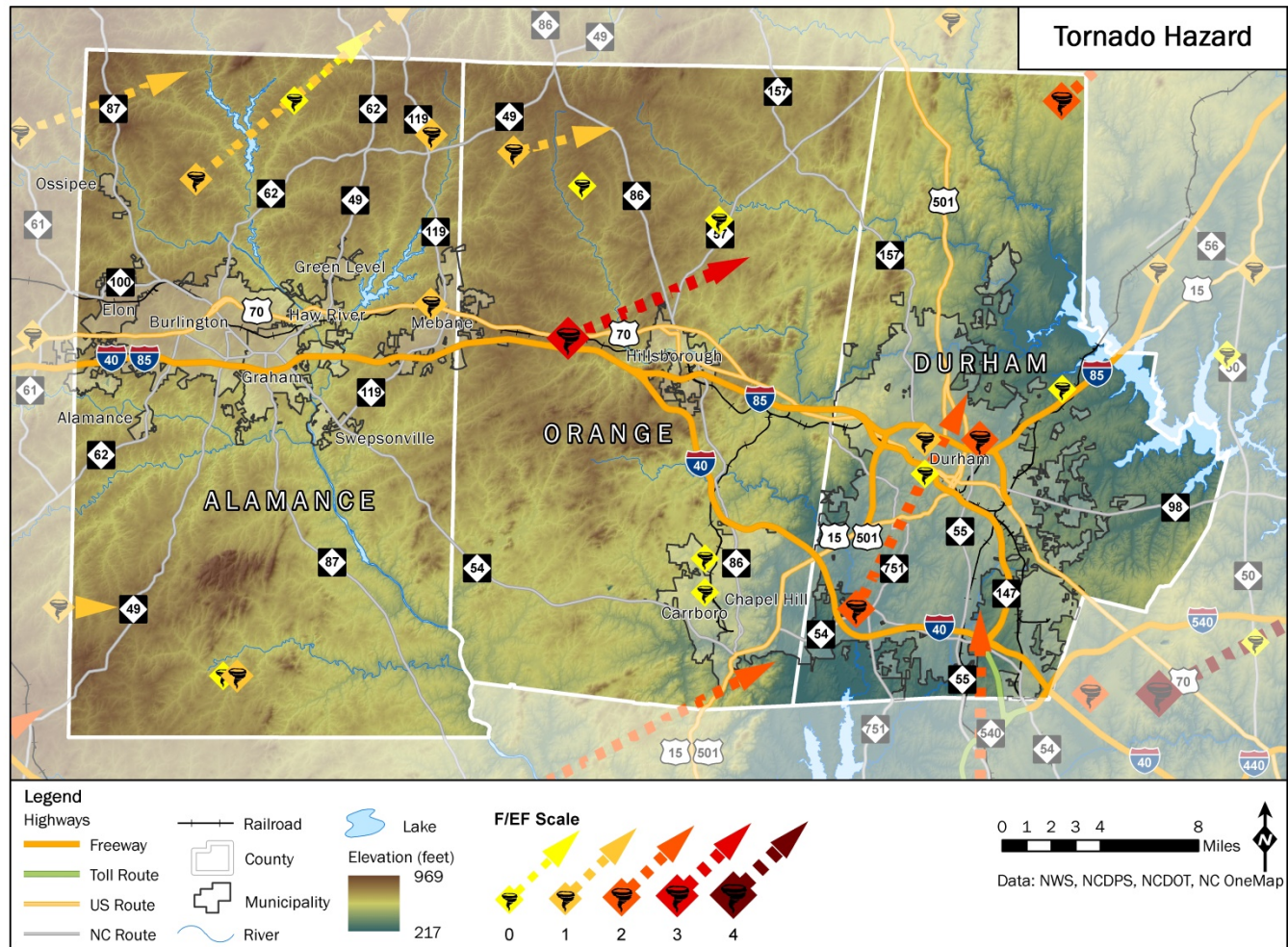
Probability of Future Occurrences

Future occurrences of potentially damaging tornadoes in the planning area are considered to be likely.

Tornado Hazard Vulnerability

All of the inventoried assets in the Eno-Haw Region are exposed to potential tornado activity. Any specific vulnerabilities of individual assets would depend greatly on individual design, building characteristics, and any existing mitigation measures currently in place. Such site-specific vulnerability determinations are outside the scope of this risk assessment but may be considered during future plan updates.

Figure 4.24: Historic Tornado Point Locations and Damage Paths in the Eno-Haw Region



4.5.2.3 Winter Weather

Winter Weather Hazard Description

In general, winter weather events may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation, all of which may create locally hazardous conditions regardless of the magnitude of the overall event. Blizzards, the most dangerous of all winter storms, combine heavy snowfall, low temperatures, and winds of at least 35 mph, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads, and other hard surfaces. Ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.

Winter Weather Hazard Analysis

Nearly the entire continental United States is susceptible to severe winter weather events. Some winter storms may be large enough to affect several states, while others might affect limited, more localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. The Eno-Haw Region is accustomed to severe winter weather conditions, and frequently receives winter weather during the winter months. Given the atmospheric nature of the hazard, the entire Region has uniform exposure to a winter storm.

Location Within the Planning Area

Winter weather, including blizzards, frosts/freezes, heavy snow, and sleet are widespread atmospheric conditions that are not isolated to a specific geographic location. Therefore it is assumed that the entire planning area is exposed to this hazard. However, it is possible to map greatest one-day snowfall as an indicator of where severe conditions have been observed in the past in the Eno-Haw Region (**Figure 5.25**).

Extent (Magnitude and Severity)

There is currently no overall scale to rank the potential severity of severe winter weather events of this type but it is assumed that the magnitude and severity of future occurrences will be similar to that of historical occurrences.

Historical Occurrences

The following historical occurrences ranging from 1996 to the present have been identified based on the NCDC Storm Events database. NCDC presents winter weather hazards under multiple subcategories. **Table 4.24** shows occurrences of winter storms, winter weather, blizzards, frost/freezes, heavy snow, and sleet. Because winter weather affects a large geographic area, this information is processed by NCDC in forecast “zones,” and therefore a municipal-level breakdown is not provided. Similarly, it is important to note that many of the events shown for one county are the same events that are counted for one of the other counties in the planning area. For these reasons, totals are not provided in the table for the Eno-Haw area as a whole as some double-counting would be inherent in the numbers. Also, only historical occurrences listed in the NCDC database are shown here and other smaller, unrecorded, or unreported events may have occurred within the planning area during this timeframe.

Figure 4.25: Greatest One-Day Snowfall in the Eno-Haw Region

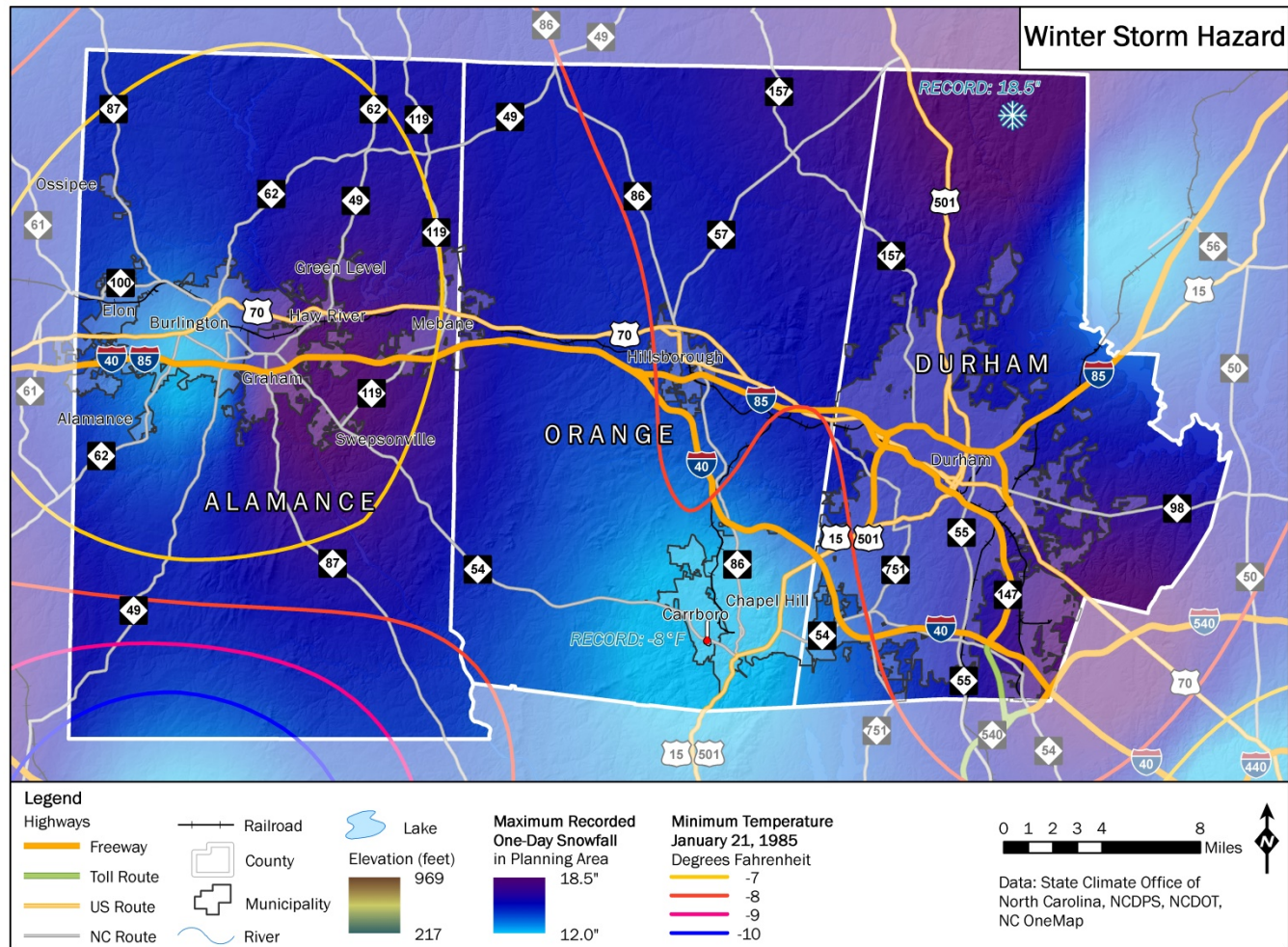


Table 4.24: Summary of Winter Weather Occurrences by Participating Jurisdiction (1950 through October 2014)

Jurisdiction	Number of Winter Storm Events	Number of Winter Weather Events	Number of Blizzard Events	Number of Frost/ Freeze Events	Number of Heavy Snow Events	Number of Sleet Events	Deaths	Injuries	Reported Property Damage	Reported Crop Damage
Alamance County	24	22	0	0	3	0	0	0	\$20,000	\$0
Orange County	23	20	0	0	3	0	0	0	\$30,000	\$0
Durham County	20	16	0	0	0	0	0	0	\$30,000	\$0

Source: National Climatic Data Center Storm Events Database

In summary, a total of at least 24 separate winter storm events, 22 separate winter weather events, 0 frost/freeze events, 3 heavy snow events, and 0 sleet events have affected the planning area since 1996, causing an estimated \$80,000 in property damages. Values are not available to calculate potential crop damages (most likely that would have been due to freezes). No deaths or injuries from winter weather have been reported.

Probability of Future Occurrences

It is assumed that the probability of future occurrences of winter weather events in the Eno-Haw Region is highly likely and is anticipated to be similar in nature to known historical occurrences.

Winter Weather Hazard Vulnerability

All of the inventoried assets in the Eno-Haw Region are exposed to potential winter weather. Any specific vulnerabilities of individual assets would depend greatly on individual design, building characteristics (such as a flat roof), and any existing mitigation measures currently in place. Such site-specific vulnerability determinations are outside the scope of this risk assessment but may be considered during future plan updates.

4.5.2.4 Hurricane and Tropical Storm

Hurricane/Tropical Storm Hazard Description

Hurricanes and tropical storms are classified as cyclones and are defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a “safety-valve,” limiting the continued build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole-ward latitudes. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation that causes inland flooding, and tornadoes. While mentioned here, each of these individual forces are more thoroughly addressed as separate hazards within this risk assessment (e.g., flood and tornado).

The key energy source for a tropical cyclone is the release of latent heat from the condensation of warm water. Their formation requires a low-pressure disturbance, warm sea surface temperature, rotational force from the spinning of the earth, and the absence of wind shear in the lowest 50,000 feet of the atmosphere. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which encompasses the months of June through November. The peak of the Atlantic hurricane season is in early to mid-September and the average number of storms that reach hurricane intensity per year in this basin is six.

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 mph, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 mph the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Scale (**Table 4.25**), which rates hurricane intensity in categories on a scale of 1 to 5, with category 5 being the most intense.

Table 4.25: Saffir-Simpson Scale for Hurricanes

Category	Maximum Sustained Wind Speed (MPH)	Minimum Surface Pressure (Millibars)	Storm Surge (Feet)
1	74–95	Greater than 980	3–5
2	96–110	979–965	6–8
3	111–130	964–945	9–12
4	131–155	944–920	13–18
5	155 +	Less than 920	19+

Source: National Oceanic and Atmospheric Administration

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds, barometric pressure and storm surge potential, which are combined to estimate potential damage. Categories 3, 4, and 5 are classified as “major” hurricanes, and while hurricanes within this range comprise only 20% of total tropical cyclone landfalls, they account for over 70% of the damage in the United States. **Table 4.26** describes the damage that could be expected for each category of hurricane. Damage during hurricanes might also result from spawned tornadoes, storm surge, and inland flooding associated with heavy rainfall that usually accompanies these storms.

Table 4.26: Hurricane Damage Classification

Category	Damage Level	Description of Damages
1	Minimal	No real damage to buildings. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage.
2	Moderate	Some roofing material, door and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings might break their moorings.
3	Extensive	Some structural damage to small residences and utility buildings, with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain might be flooded well inland.
4	Extreme	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain might be flooded well inland.
5	Catastrophic	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas might be required.

Source: National Oceanic and Atmospheric Administration, Federal Emergency Management Agency

Hurricane/Tropical Storm Hazard Analysis

On average, North Carolina experiences a hurricane approximately once every two years. Substantial hurricane damage is typically most likely to be expected in the easternmost counties of the state; however, hurricane and tropical storm-force winds have significantly impacted areas far inland, including Alamance, Orange, and Durham counties. In fact, five such storms have passed within 75 miles of the planning area since 1851, the first of which being in 1893 (see **Figure 4.26**

and **Table 4.27**). The total number of five includes two Category 2 hurricanes and three Category 1 hurricanes.

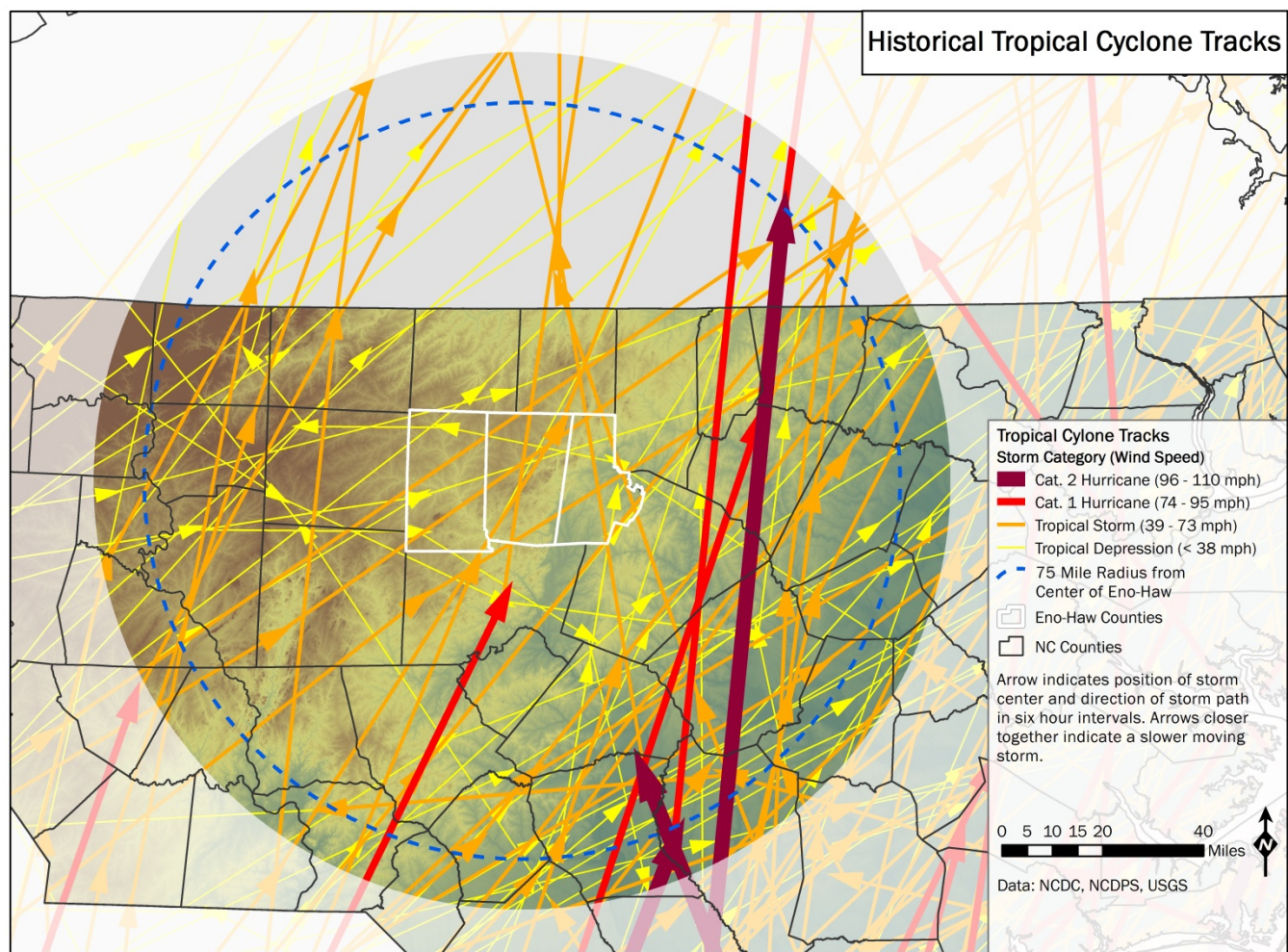
Location Within the Planning Area

Hurricanes and tropical storms are widespread atmospheric disturbances that are not isolated to a specific geographic location within the planning area. Therefore it is assumed that the entire planning area is exposed to this hazard.

Extent (Magnitude and Severity)

Hurricanes and tropical storms of any magnitude and severity are theoretically possible within the planning area, however major hurricanes (Category 3 and greater) are less likely to retain that classification as far inland as the Eno-Haw Region. Since the 1850s, the greatest magnitude hurricane to impact the planning area has been a Category 2 hurricane (see *Historical Occurrences* section below). A Category 2 hurricane typically results in moderate damage including some damage to roofing material, doors and windows; and considerable damage to vegetation, mobile homes, etc. A Category 1 hurricane typically results in minimal damages, including damage primarily to unanchored mobile homes, shrubbery, and trees.

Figure 4.26: Historical Hurricane and Tropical Storm Tracks in the Eno-Haw Region



Historical Occurrences

Table 4.27 lists the five hurricane and tropical storm paths that have crossed within a 75 statute mile radius of the mean center of the planning area from 1851 to 2011 (the data from the National Hurricane Center is only current through 2011). This table only shows events with hurricane force winds. As the previous figure illustrates, there have been multiple extratropical and subtropical events that have come within close proximity to the planning area, however the maximum wind speeds associated with these lesser events have had a much less substantial impact on the region. It does seem as though wind speeds have gotten somewhat progressively more severe over the past 160 years.

Table 4.27: Historical Occurrences of Hurricane Storm Paths Crossing within 75 Miles of the Planning Area

Name	Date	Magnitude	Maximum Recorded Wind Speed (mph)
Not Named	10/13/1893	Category 1	80
Not Named	9/29/1896	Category 1	85
Not Named	10/31/1899	Category 1	75
Hurricane Hazel	10/15/1954	Category 2	110
Hurricane Fran	9/6/1996	Category 2	100

Source: NOAA National Hurricane Center

Figure 4.42 is based on the mapped paths of the storm systems shown in Table 4.28. **Table 4.28** lists significant hurricane and tropical storm events recorded by NCDC since 1996. The events recorded in the table below may reflect storms that did not pass within 75 miles of the planning area but that were still significant to the planning area in some way.

Table 4.28: Historical Occurrences of Hurricanes and Tropical Storms (1996 through October 2014)

Date	Name	Deaths	Injuries	Reported Property Damage	Reported Crop Damage
ALAMANCE COUNTY					
7/12/1996	Hurricane Bertha	0	0	\$0	\$0
9/5/1996	Hurricane Fran	1	0	\$0	\$0
9/4/1999	Hurricane Dennis (Remnants)	0	0	\$0	\$3,000,000
9/15/1999	Hurricane Floyd	0	0	\$3,000,000,000	\$500,000
<i>Subtotal Alamance</i>		<i>1</i>	<i>0</i>	<i>\$3,000,000,000</i>	<i>\$3,500,000</i>
ORANGE COUNTY					
7/12/1996	Hurricane Bertha	0	0	\$0	\$0
9/5/1996	Hurricane Fran	0	0	\$0	\$0
9/4/1999	Hurricane Dennis (Remnants)	0	0	\$0	\$0
9/15/1999	Hurricane Floyd	0	0	\$0	\$0
<i>Subtotal Orange</i>		<i>0</i>	<i>0</i>	<i>\$0</i>	<i>\$0</i>
DURHAM COUNTY					
7/12/1996	Hurricane Bertha	0	0	\$0	\$0
9/5/1996	Hurricane Fran	1	0	\$0	\$0

Date	Name	Deaths	Injuries	Reported Property Damage	Reported Crop Damage
9/4/1999	Hurricane Dennis (Remnants)	0	0	\$0	\$0
9/15/1999	Hurricane Floyd	0	0	\$0	\$0
9/18/2003	Hurricane Isabel	0	0	\$205,000	\$0
<i>Subtotal Orange</i>		<i>1</i>	<i>0</i>	<i>\$205,000</i>	<i>\$0</i>
TOTAL ENO-HAW		2	0	\$3,000,205,000	\$3,500,000

Source: National Climatic Data Center

Probability of Future Occurrences

Future occurrences of hurricanes and tropical storms is considered to be likely.

Hurricane/Tropical Storm Hazard Vulnerability

All of the inventoried assets in the Eno-Haw Region are exposed to potential hurricane and tropical storm events. Any specific vulnerabilities of individual assets would depend greatly on individual design, building characteristics, and any existing mitigation measures currently in place. Such site-specific vulnerability determinations are outside the scope of this risk assessment but may be considered during future plan updates.

4.5.3 Geologic Hazards

Geologic hazards include landslides and earthquakes. As with the other hazard types discussed in this risk assessment, geologic hazards may occur as a result of or in combination with other hazards. For example, excessive rainfall can contribute to landslide occurrences, etc.

4.5.3.1 Landslide

Landslide Hazard Description

A landslide is the downward and outward movement of slope-forming soil, rock, and vegetation, which is driven by gravity. Landslides may be triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes due to construction or erosion, earthquakes, volcanic eruptions, and changes in groundwater levels. Landslides occur when the force of gravity pulling down the slope exceeds the strength of the earth materials that comprise to hold it in place.

There are several types of landslides: rock falls, rock topple, slides, slumps, and debris flows. Rock falls are rapid movements of bedrock, which result in bouncing or rolling. A topple is a section or block of rock that rotates or tilts before falling to the slope below. Slides are movements of soil or rock along a distinct surface of rupture, which separates the slide material from the more stable underlying material. Slumps are landslides that typically occur on smaller slopes when loosely consolidated materials or rock layers move a short distance down a slope, typically in a rotational fashion. Debris flows, sometimes referred to as mudslides, mudflows, lahars, or debris avalanches, are fast-moving rivers of rock, earth, and other debris saturated with water.

Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. Slopes are also more likely to

fail if vegetative cover is low and/or soil water content is high. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Slopes greater than 10 degrees are more likely to slide, as are slopes where the height from the top of the slope to its toe is greater than 40 feet.

In the United States, it is estimated that landslides cause up to \$2 billion in damages and from 25 to 50 deaths annually. Globally, landslides cause billions of dollars in damage and thousands of deaths and injuries each year.

Landslide Hazard Analysis

Location Within the Planning Area

Figure 4.27 shows information developed by the United States Geological Survey (USGS) which depicts areas of landslide incidence and susceptibility. This information suggests that there is some significant potential risk that is not supported by any historical data or detailed landslide hazard mapping presently available for the planning area. In addition, **Figure 4.28** shows slope and average annual precipitation data for the Eno-Haw Region.

Figure 4.27: Landslide Susceptibility and Incidence Data for the Eno-Haw Region

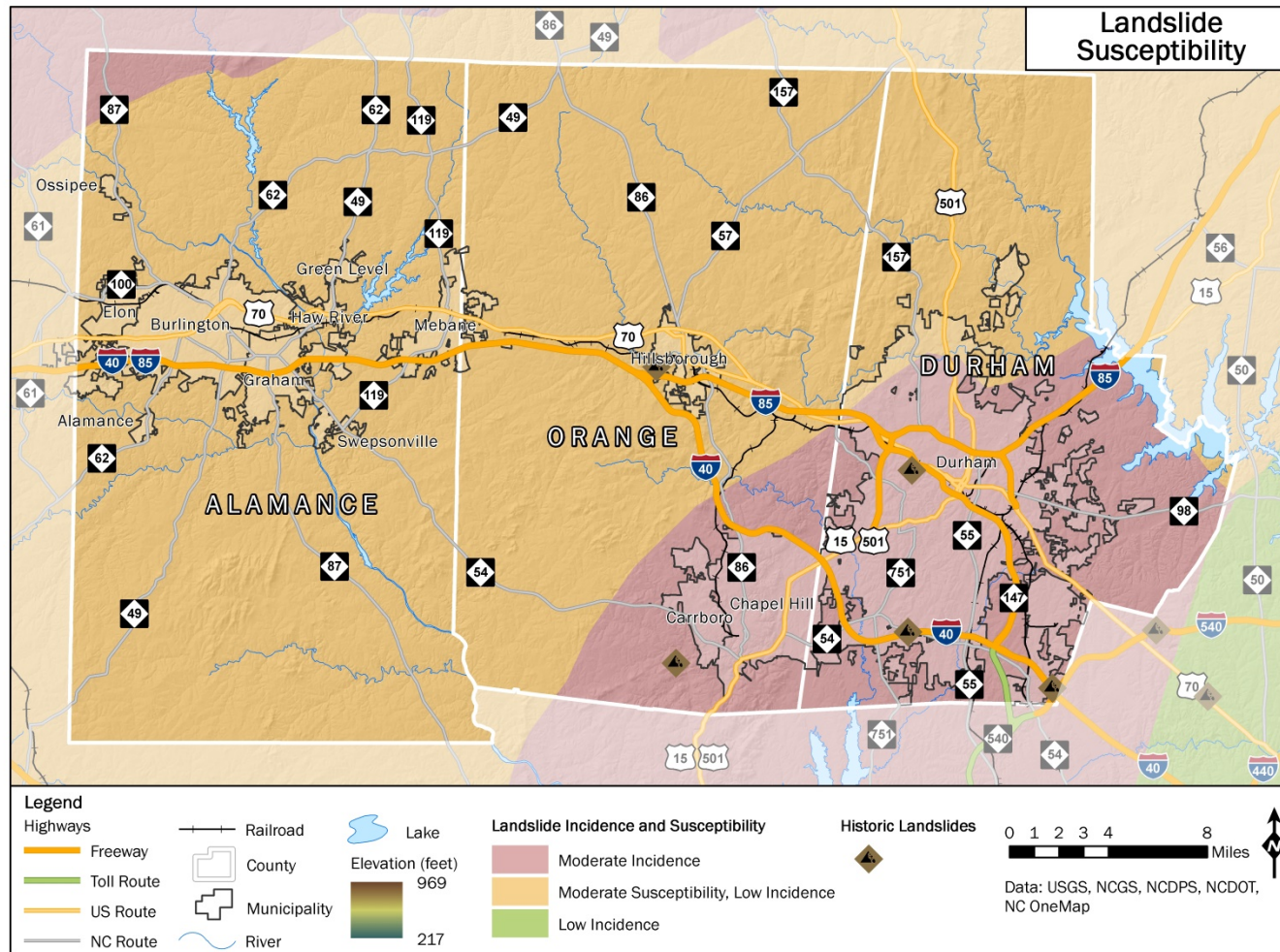
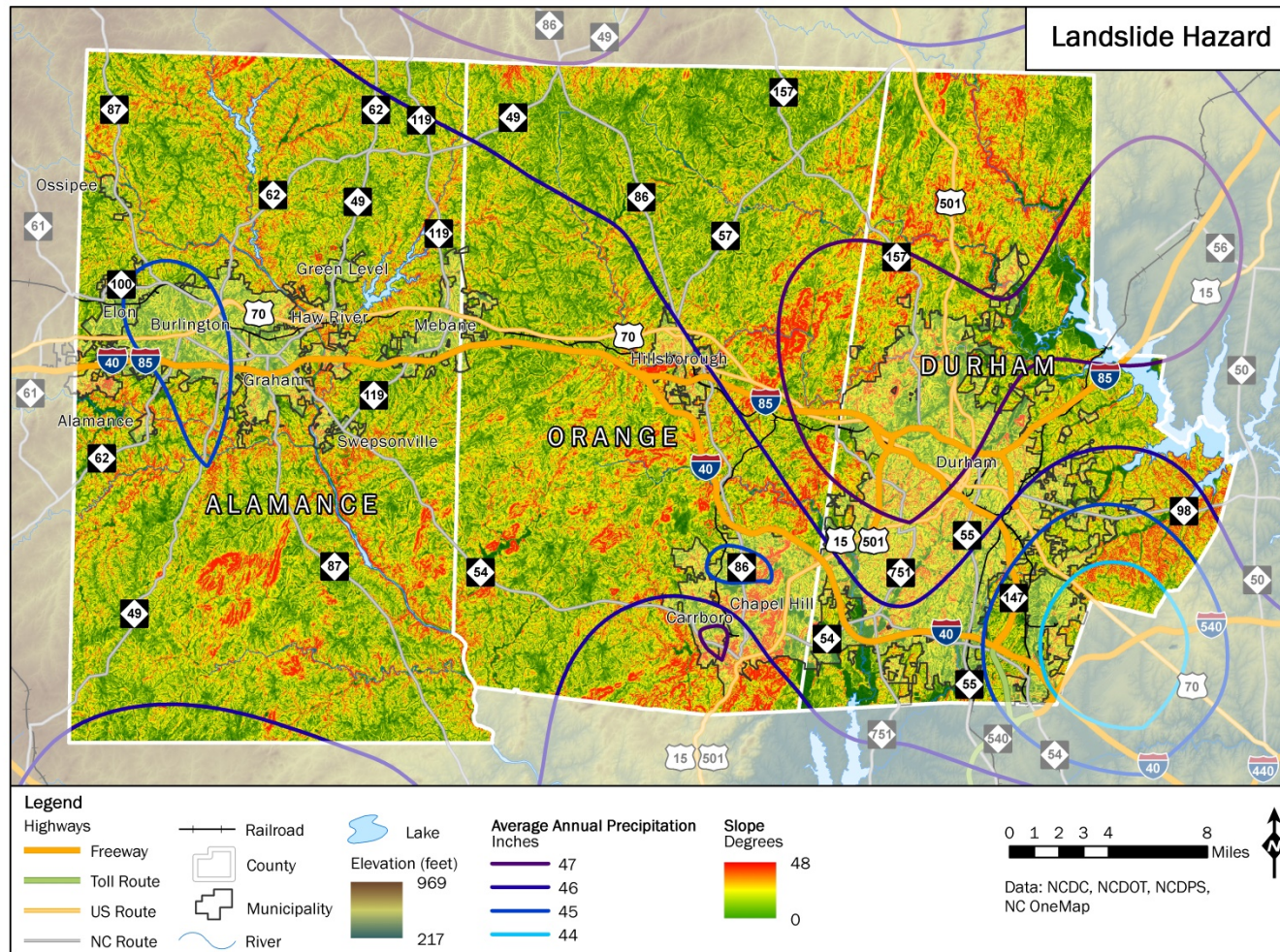


Figure 4.28: Slope and Average Annual Precipitation Data for the Eno-Haw Region



Extent (Magnitude and Severity)

The magnitude and severity of landslides can vary greatly depending on terrain and other highly localized factors. In addition, there is no overall severity rating scale for landslides that can be applied to the Eno-Haw Region.

Historical Occurrences

There are no records of historical occurrences of significant landslides in the planning area.

Landslide Hazard Vulnerability

Sufficient hazard information is not currently available with which to conduct a detailed vulnerability assessment. In addition, any specific vulnerabilities of individual assets would depend on individual design, building characteristics, and any existing mitigation measures currently in place. Such site-specific vulnerability determinations are outside the scope of this risk assessment but may be considered during future plan updates.

4.5.3.2 Earthquake

Earthquake Hazard Description

An earthquake is the motion or trembling of the ground produced by sudden displacement of rock in the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of caverns. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons; and disrupt the social and economic functioning of the affected area. Most property damage and earthquake-related deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage depends upon the amplitude and duration of the shaking, which are directly related to the earthquake size, distance from the fault, site, and regional geology. Other damaging earthquake effects include landslides, the down-slope movement of soil and rock (mountain regions and along hillsides), and liquefaction, in which ground soil loses the ability to resist shear and flows much like quick sand. In the case of liquefaction, anything relying on the substrata for support can shift, tilt, rupture, or collapse.

Most earthquakes are caused by the release of stresses accumulated as a result of the rupture of rocks along opposing fault planes in the Earth's outer crust. These fault planes are typically found along borders of the Earth's 10 tectonic plates. The areas of greatest tectonic instability occur at the perimeters of the slowly moving plates, as these locations are subjected to the greatest strains from plates traveling in opposite directions and at different speeds. Deformation along plate boundaries causes strain in the rock and the consequent buildup of stored energy. When the built-up stress exceeds the rocks' strength, a rupture occurs. The rock on both sides of the fracture is snapped, releasing the stored energy and producing seismic waves, generating an earthquake.

Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude (**Table 4.29**). Each unit increase in magnitude on the Richter Scale corresponds to a 10-fold increase in wave amplitude, or a 32-fold increase in energy. Intensity is most commonly measured using the Modified Mercalli Intensity (MMI) Scale based on direct and indirect measurements of seismic effects. A detailed description of the Modified Mercalli Intensity Scale of earthquake intensity and its correspondence to the Richter Scale is given in **Table 4.30**.

Table 4.29: Richter Scale

Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt but recorded.
3.5 to 5.4	Often felt but rarely causes damage.
Under 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 to 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 to 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or greater	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: Federal Emergency Management Agency.

Table 4.30: Modified Mercalli Intensity Scale for Earthquakes

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: Federal Emergency Management Agency.

Earthquake Hazard Analysis

Approximately two-thirds of North Carolina is subject to earthquakes, with the western and southeast region most vulnerable to a very damaging earthquake. The state is affected by both the Charleston Fault in South Carolina and the New Madrid Fault in Tennessee. Both of these faults have generated earthquakes measuring greater than 8 on the Richter Scale during the last 200 years. In addition, there are several smaller fault lines throughout North Carolina.

Location Within the Planning Area

Figure 4.29 shows peak ground acceleration (PGA) and historic earthquake epicenters for the state of North Carolina and relevant surrounding areas. **Figures 4.30** through **4.32** show PGA at the county level for the three counties in the planning area.

Figure 4.29: Peak Ground Acceleration and Historic Epicenters Relevant to the Eno-Haw Region

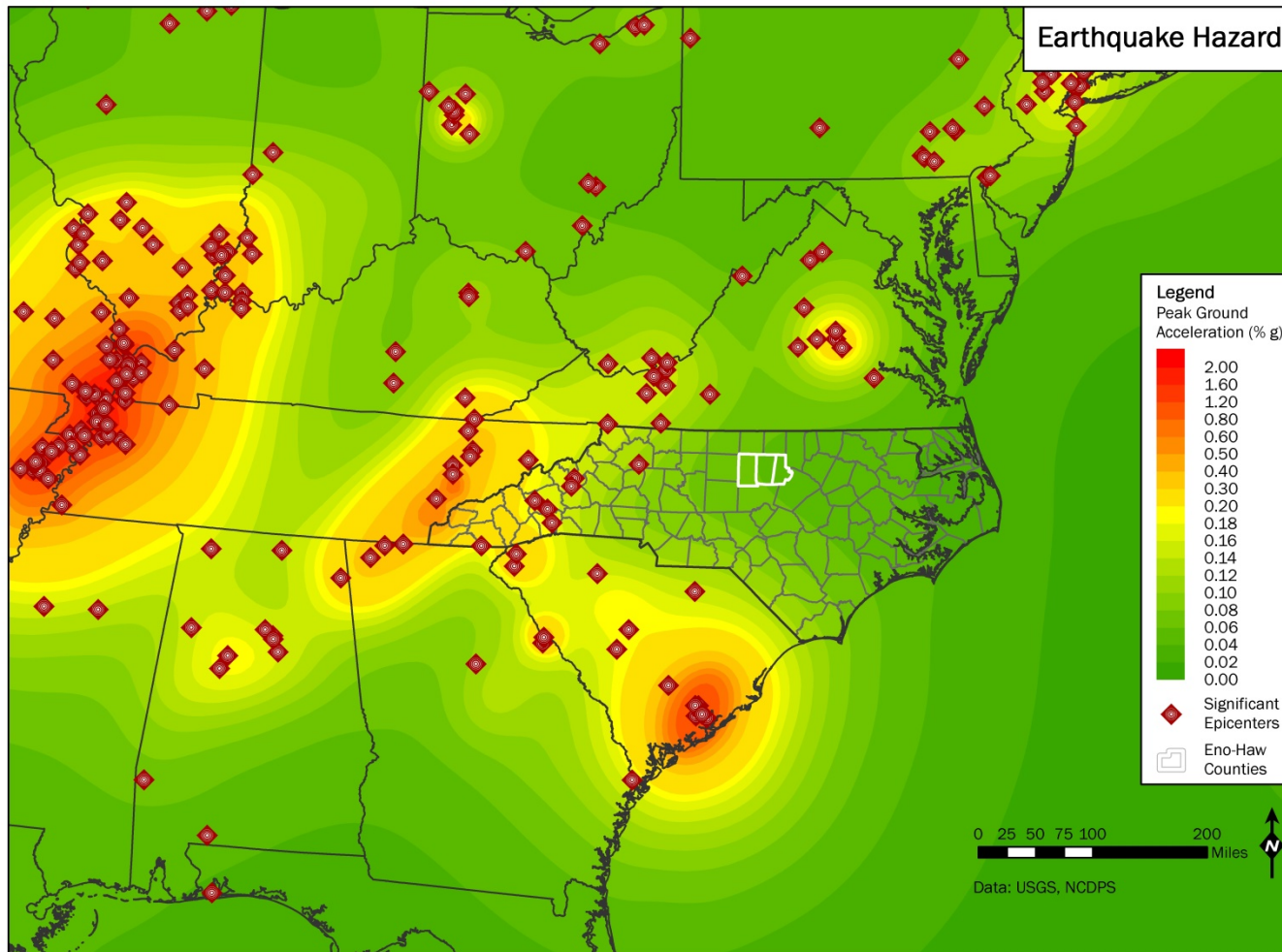


Figure 4.30: Peak Ground Acceleration for Alamance County

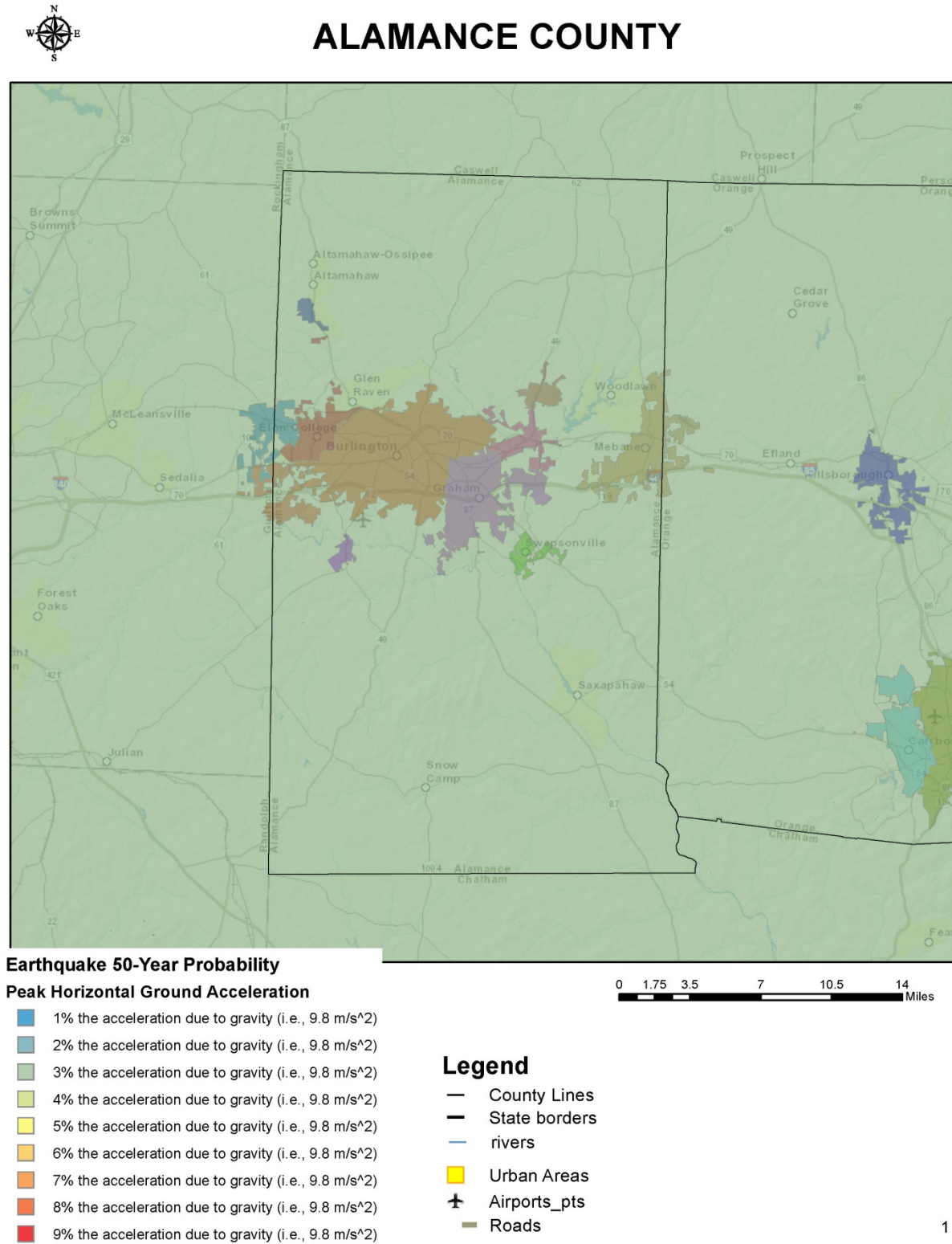


Figure 4.31: Peak Ground Acceleration for Orange County

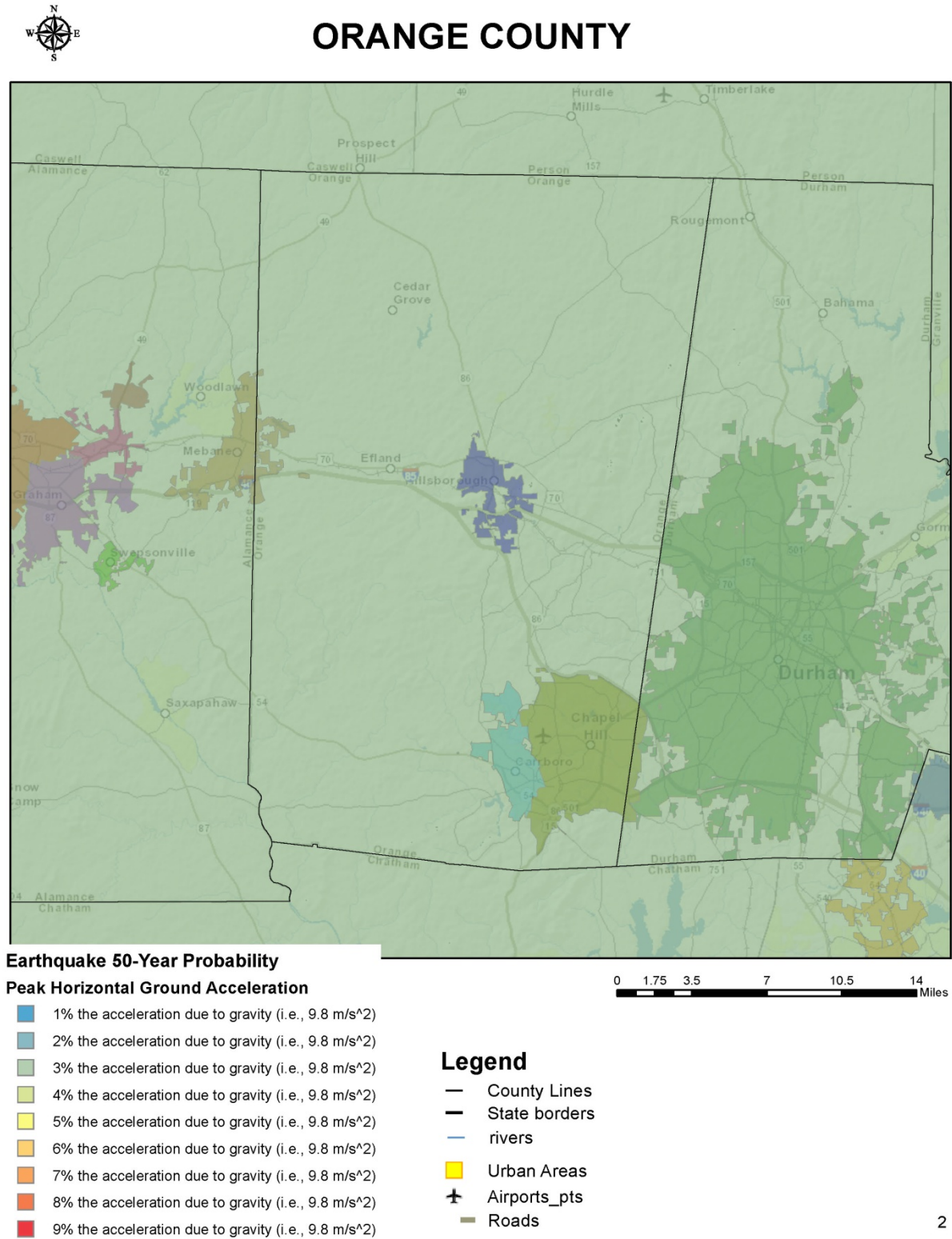
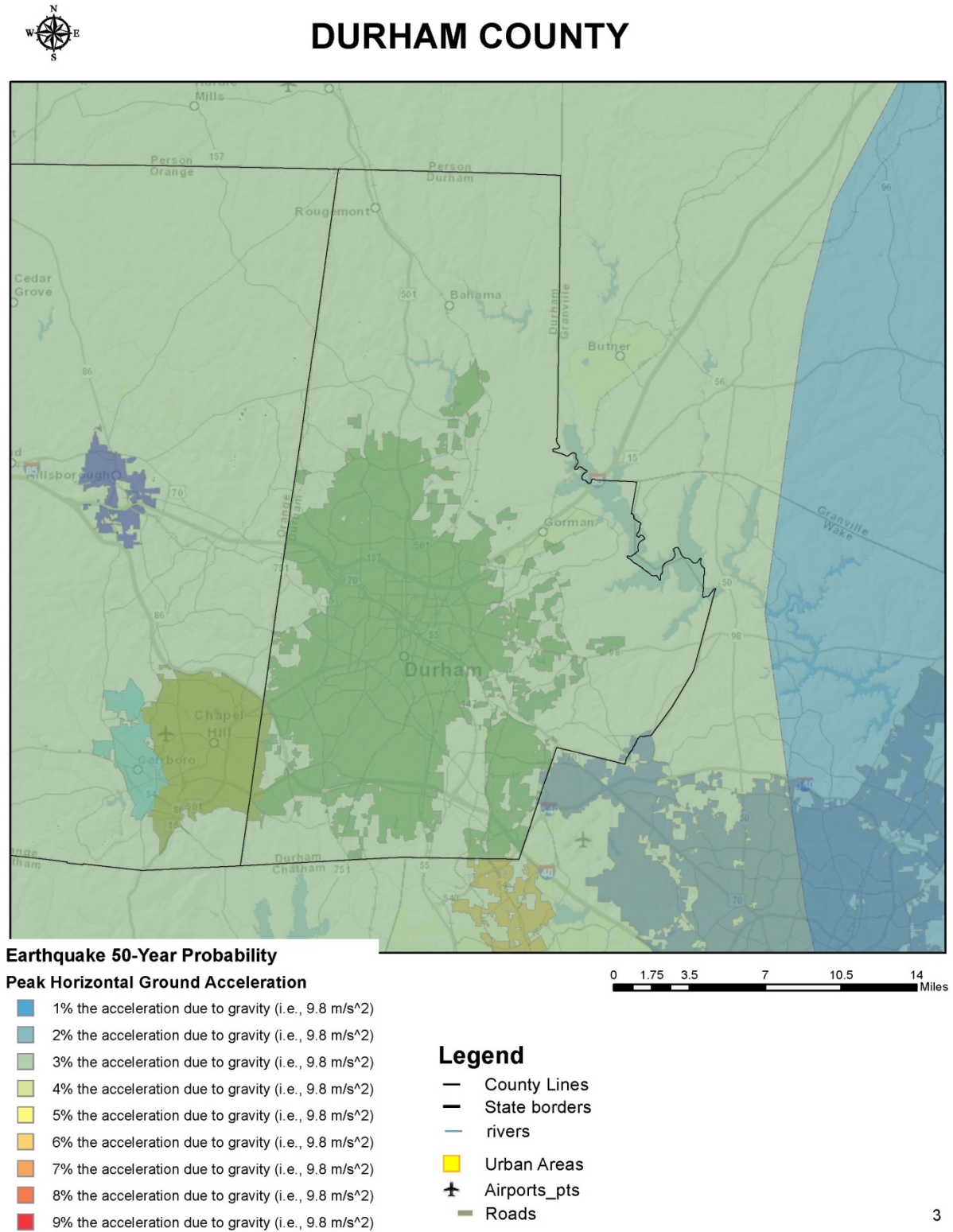


Figure 4.32: Peak Ground Acceleration for Durham County



Extent (Magnitude and Severity) and Historical Occurrences

According to USGS, there is a 0.30% chance of a major earthquake occurring within 50 kilometers of the City of Durham within the next 50 years. The largest earthquake within 30 miles of Durham was a 2.7 magnitude in 1978. There was another 2.7 magnitude earthquake that was felt 4.25 miles from Greensboro (in neighboring Guilford County) in 1993.

Probability of Future Occurrences

The probability of significant, damaging earthquake events affecting the Eno-Haw Region is considered to be unlikely. However, it is likely that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light may affect the Region to some degree.

Earthquake Hazard Vulnerability

Due to the relatively low probability of an earthquake occurrence producing significant damages in the participating jurisdictions, a detailed vulnerability assessment was not conducted for this hazard.

4.5.4 Other Hazards

The wildfire hazard does not fit into any of the hazard classifications described above (hydrologic, atmospheric, and geologic). Therefore, wildfire is presented here under the category of “Other Hazards.”

4.5.4.1 Wildfire

Wildfire Hazard Description

A wildfire is any fire occurring in a wildland area (e.g., grassland, forest, brush land) except for fire under prescription. Wildfires are part of the natural management of forest ecosystems, but may also be caused by human factors. Nationally, over 80% of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning.

There are three classes of wildland fires: surface fire, ground fire, and crown fire. A surface fire is the most common of these three classes and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire (muck fire) is usually started by lightning or human carelessness and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildland fires are usually signaled by dense smoke that fills the area for miles around.

Wildfire probability depends on local weather conditions, outdoor activities such as camping, debris burning, and construction, and the degree of public cooperation with fire prevention measures. Drought conditions and other natural hazards (tornadoes, hurricanes, etc.) increase the probability of wildfires by producing fuel in both urban and rural settings. Forest damage from hurricanes and tornadoes may also block interior access roads and fire breaks, pull down overhead power lines, or damage pavement and underground utilities.

Wildfires can cause significant damage to property and threatens the lives of people who are unable to evacuate wildfire-prone areas. Many individual homes and cabins, subdivisions, resorts,

recreational areas, organizational camps, businesses, and industries are located within high wildfire hazard areas. Further, the increasing demand for outdoor recreation places more people in wildlands during holidays, weekends, and vacation periods. Unfortunately, wildland residents and visitors are rarely educated or prepared for wildfire events that can sweep through the brush and timber and destroy property within minutes.

Wildfires can result in severe economic losses. Businesses that depend on timber, such as paper mills and lumber companies, experience losses that are often passed along to consumers through higher prices, and sometimes jobs are lost. The high cost of responding to and recovering from wildfires can deplete state resources and increase insurance rates. The economic impact of wildfires can also be felt in the tourism industry if roads and tourist attractions are closed due to health and safety concerns, such as reduced air quality by means of wildfire smoke and ash.

Wildfire Hazard Analysis

The entire Eno-Haw Region is at risk to a wildfire occurrence. However, drought conditions may make a fire more likely in certain locations under certain conditions. Further, areas in the urban-wildland interface are particularly susceptible to fire hazards as populations inhabit formerly undeveloped areas.

Location Within the Planning Area

In an effort to identify specific potential wildfire hazard areas within the planning area, a GIS-based data layer called the Wildland Fire Susceptibility Index (WFSI) was obtained from the North Carolina Division of Forest Resources (NCDFR). The WFSI is a component layer derived from the Southern Wildfire Risk Assessment (SWRA), a multi-year project to assess and quantify wildfire risk for the 13 Southern states. The WFSI is a value between 0 and 1. It was developed consistent with the mathematical calculation process for determining the probability of an acre burning. The WFSI integrates the probability of an acre igniting and the expected final fire size based on the rate of spread in four weather percentile categories into a single measure of wildland fire susceptibility. Due to some necessary assumptions, mainly fuel homogeneity, it is not the true probability. But since all areas of the planning area have this value determined consistently, it allows for comparison and ordination of areas as to the likelihood of an acre burning.

Figures 4.33 through 4.45 illustrate the level of wildfire potential for the planning area based on the WFSI data provided by NCDFR. Areas with a WFSI value of 0.01–0.05 were considered to be at moderate risk to the wildfire hazard. Areas with a WFSI value greater than 0.05 were considered to be at high risk to the wildfire hazard. Areas with a WFSI value less than 0.01 were considered to not be at risk to the wildfire hazard.

Extent (Magnitude and Severity)

The average size of wildfires in the Eno-Haw Region is typically small.

Historical Occurrences

According to statistics provided by NCDFR, the 5-year average number of fires for the Eno-Haw region was 41.8. The 5-year average number of acres burned was 129.94. **Table 4.31** shows a breakdown of the number of fires and number of acres burned by county by year from 2009 through 2013.

Table 4.31: Historical Occurrences of Wildfire

County	2009	2010	2011	2012	2013
Alamance					
Number of Fires	5	3	10	3	2
Number of Acres Burned	11.4	1.7	46.0	4.5	1.2
Orange					
Number of Fires	18	31	35	13	16
Number of Acres Burned	46.6	32.6	47.5	31.5	43.6
Durham					
Number of Fires	18	24	12	8	11
Number of Acres Burned	25.0	62.0	62.8	196.0	37.3
TOTAL ENO-HAW					
Number of Fires	41	58	57	24	29
Number of Acres	83.0	96.3	156.3	232.0	82.1

Source: North Carolina Division of Forest Resources.

Probability of Future Occurrences

It is assumed that wildfire occurrences of these types and magnitudes will continue to be likely in the planning area.

Figure 4.33: Wildfire Hazard Areas in the Village of Alamance

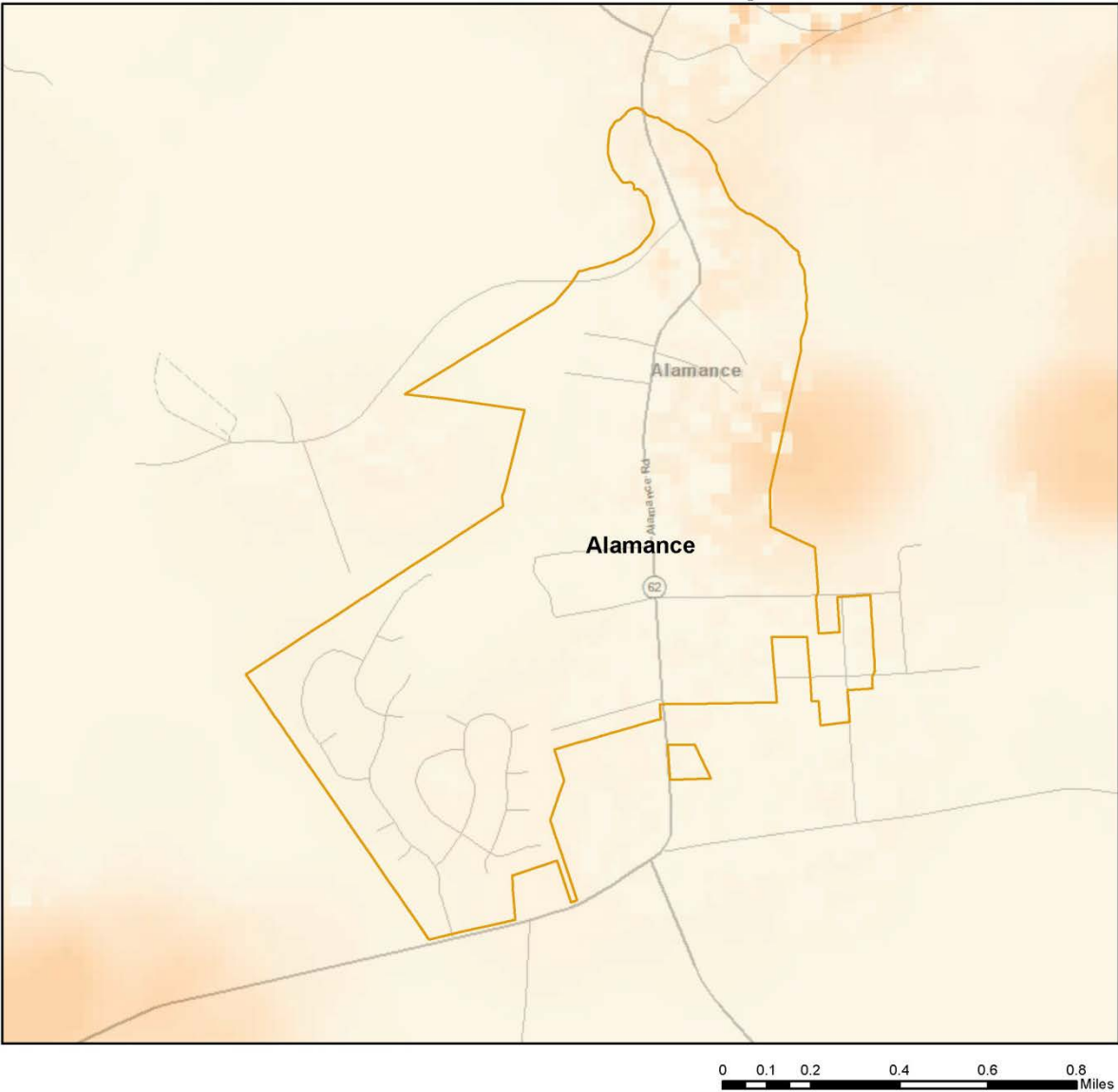
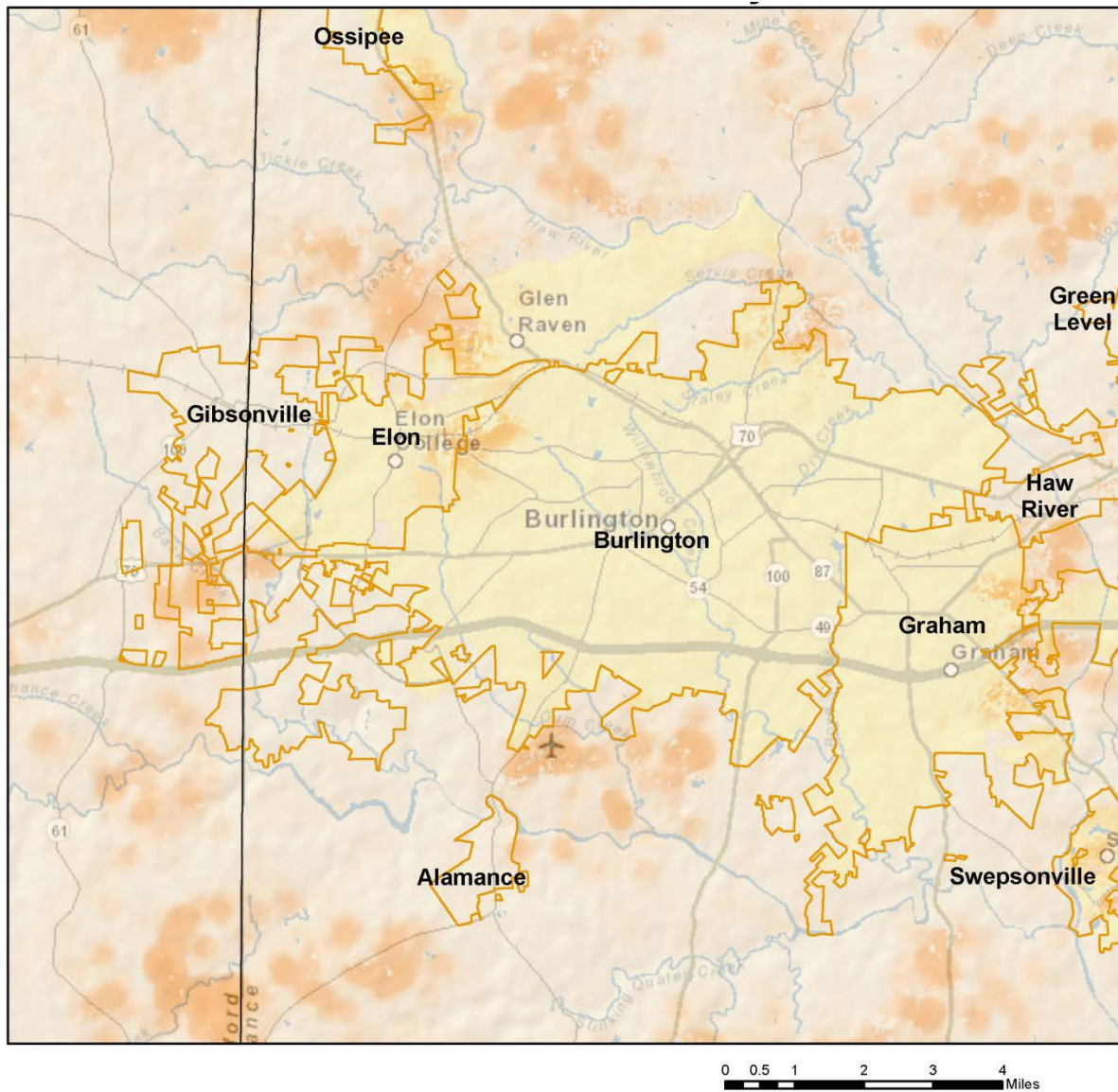


Figure 4.34: Wildfire Hazard Areas in the City of Burlington



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Figure 4.35: Wildfire Hazard Areas in the Town of Elon

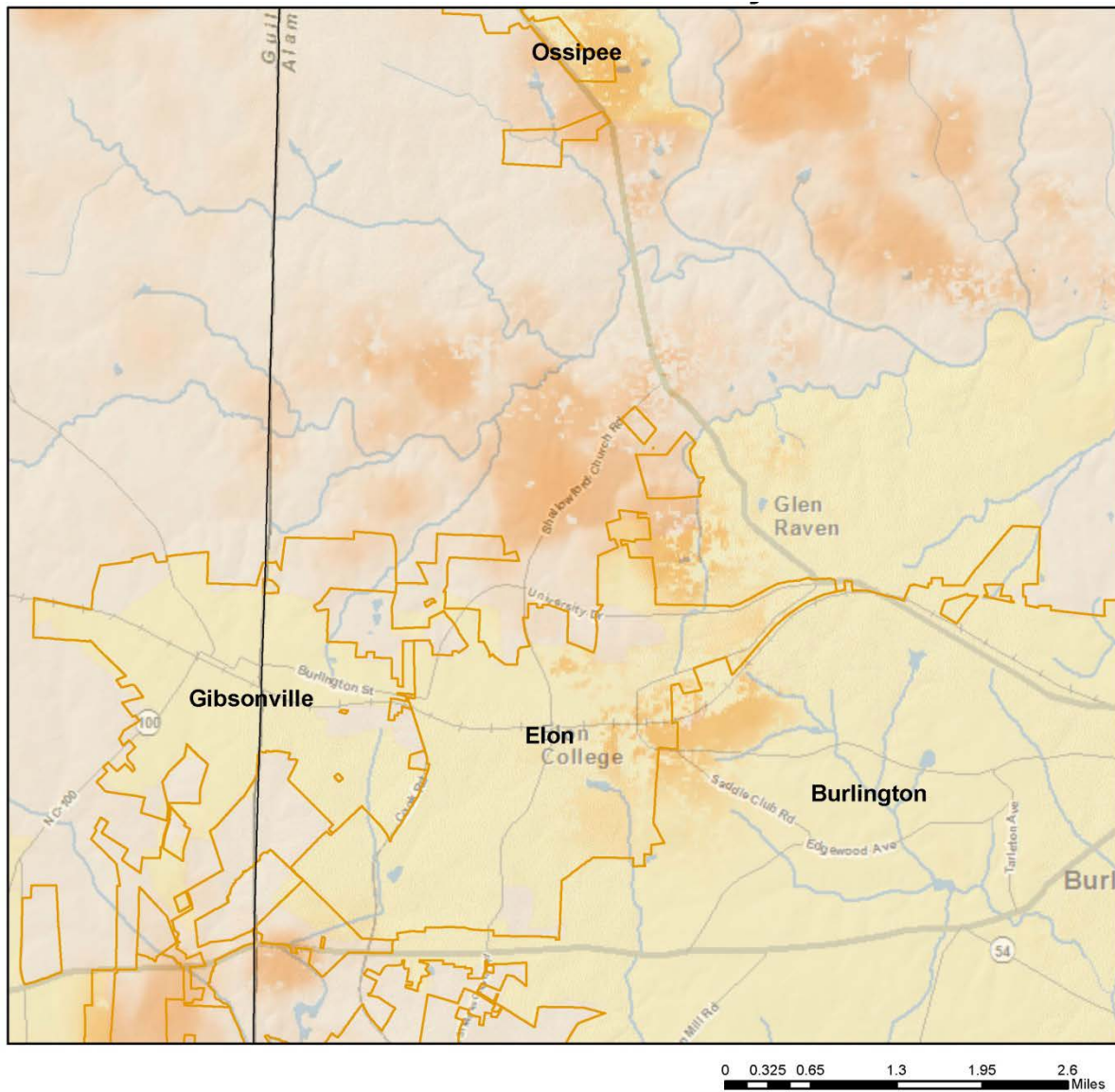


Figure 4.36: Wildfire Hazard Areas in the City of Graham

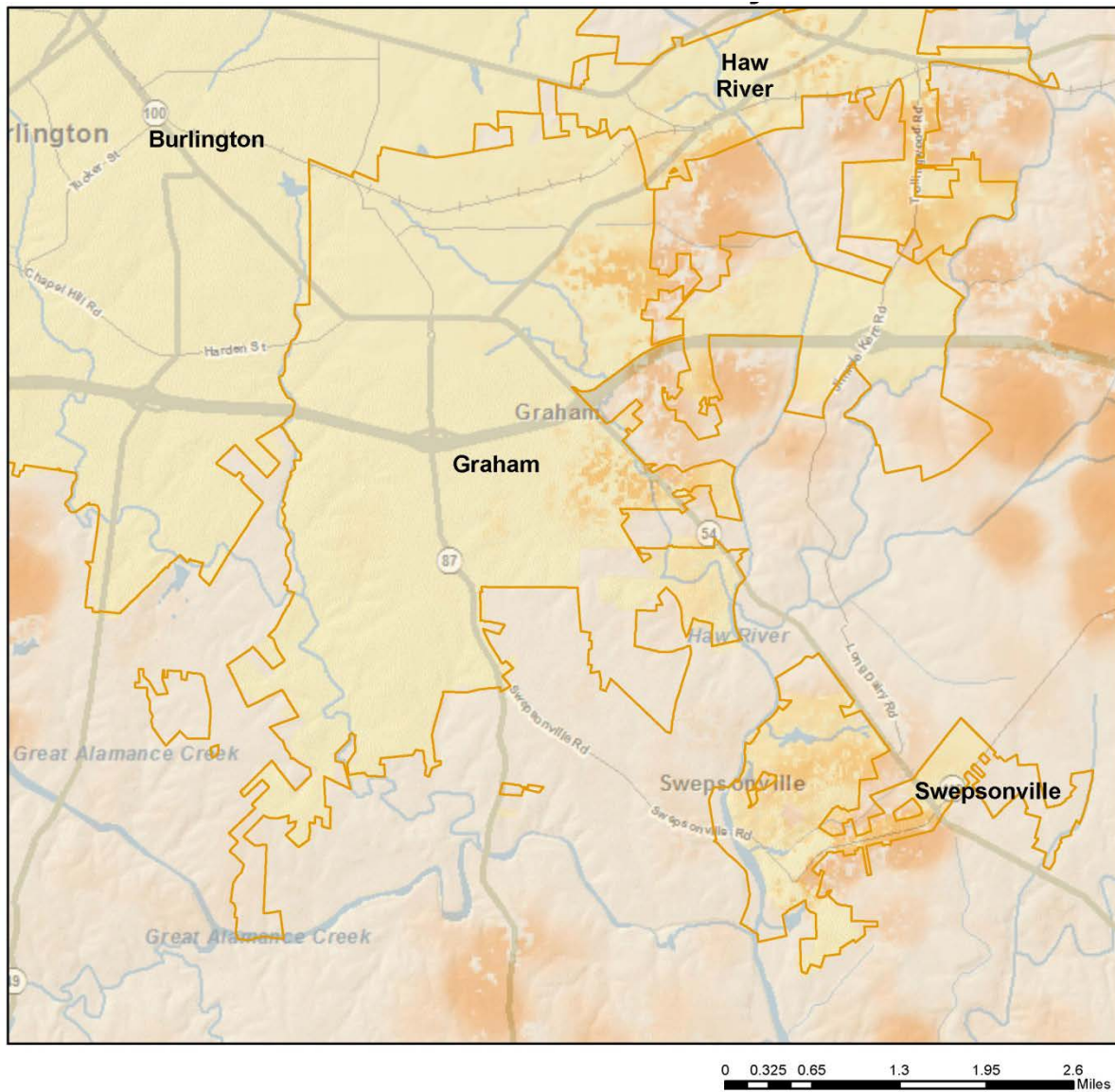


Figure 4.37: Wildfire Hazard Areas in the Town of Green Level

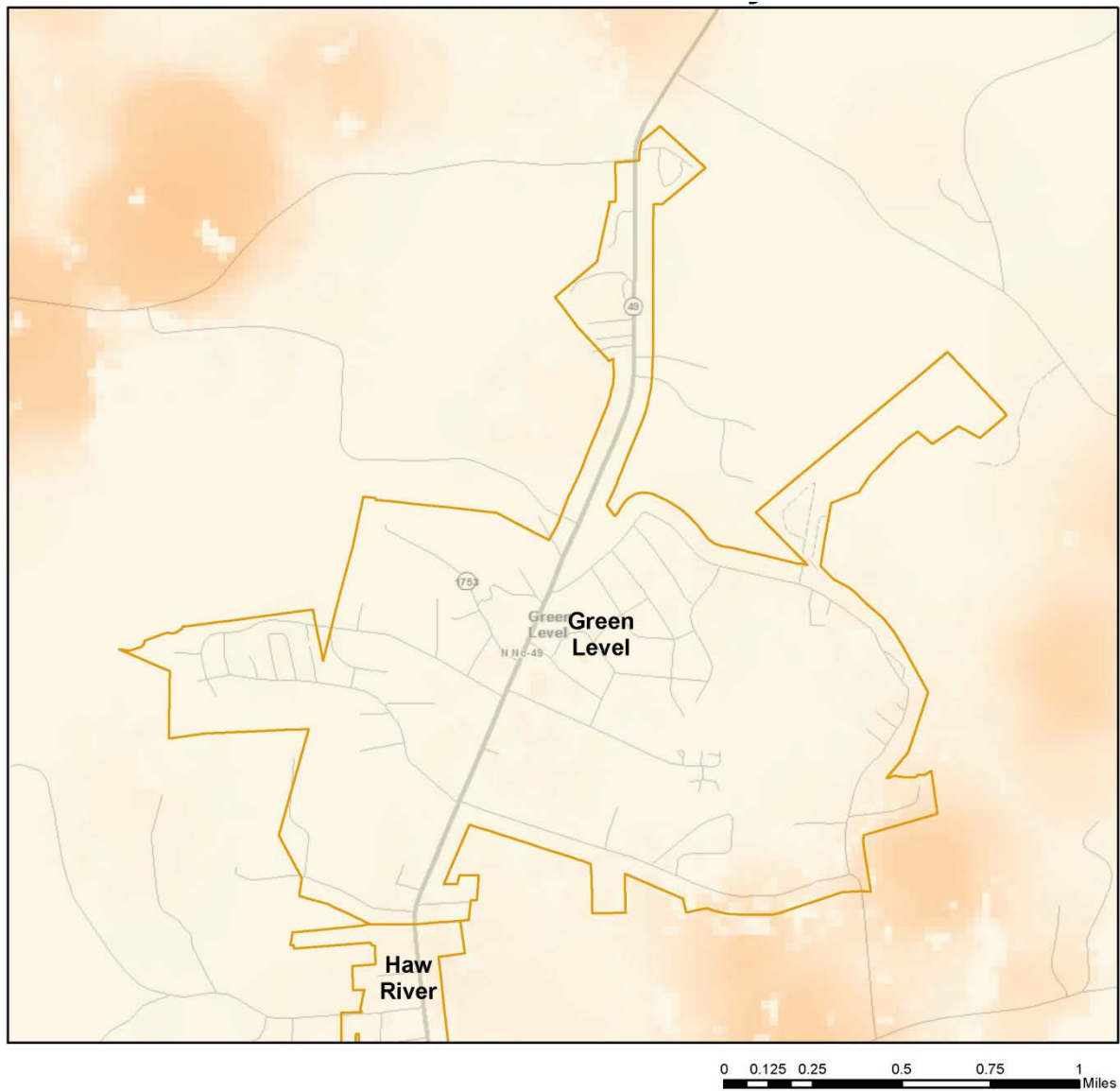


Figure 4.38: Wildfire Hazard Areas in the Town of Haw River

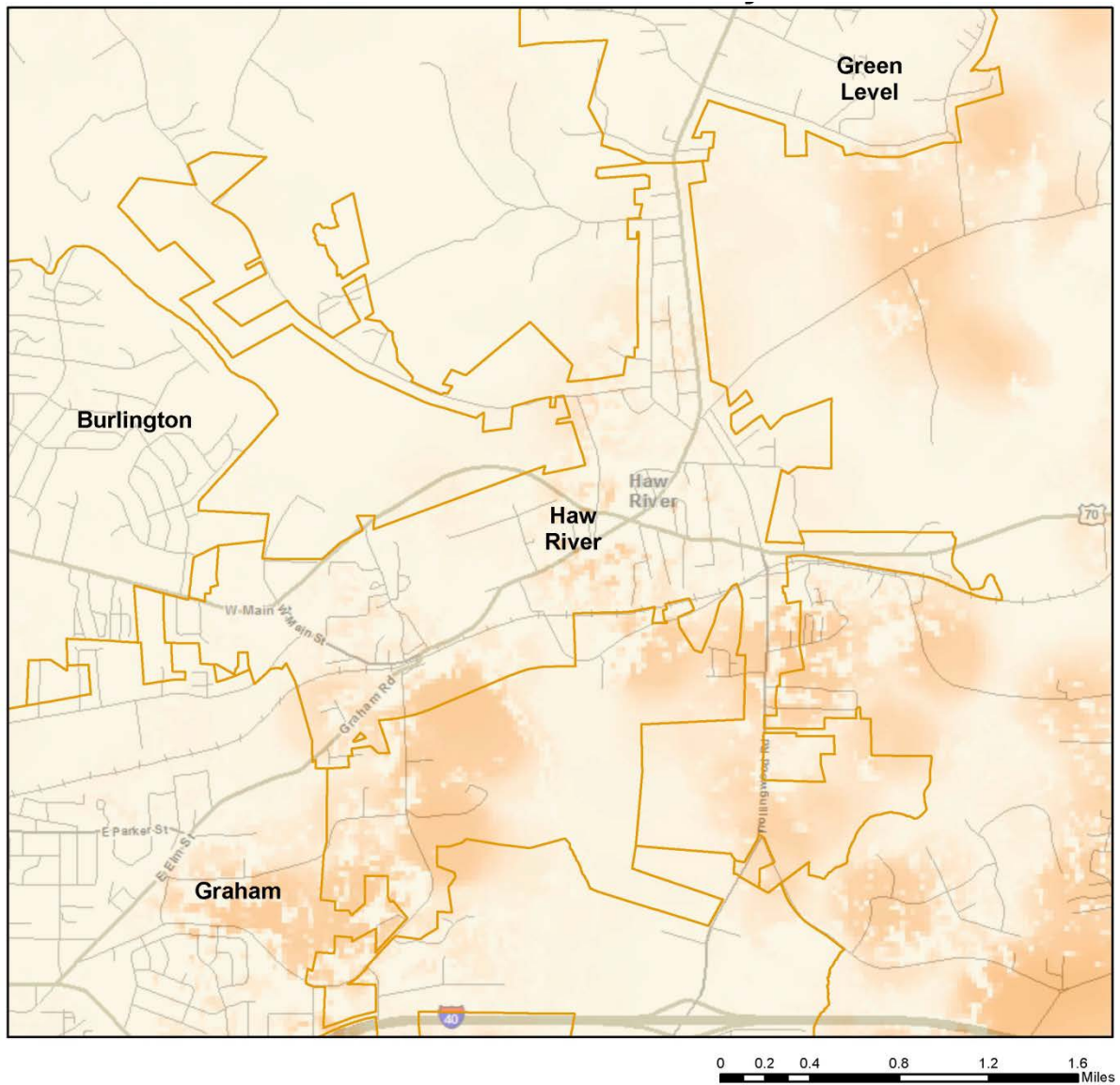


Figure 4.39: Wildfire Hazard Areas in the City of Mebane

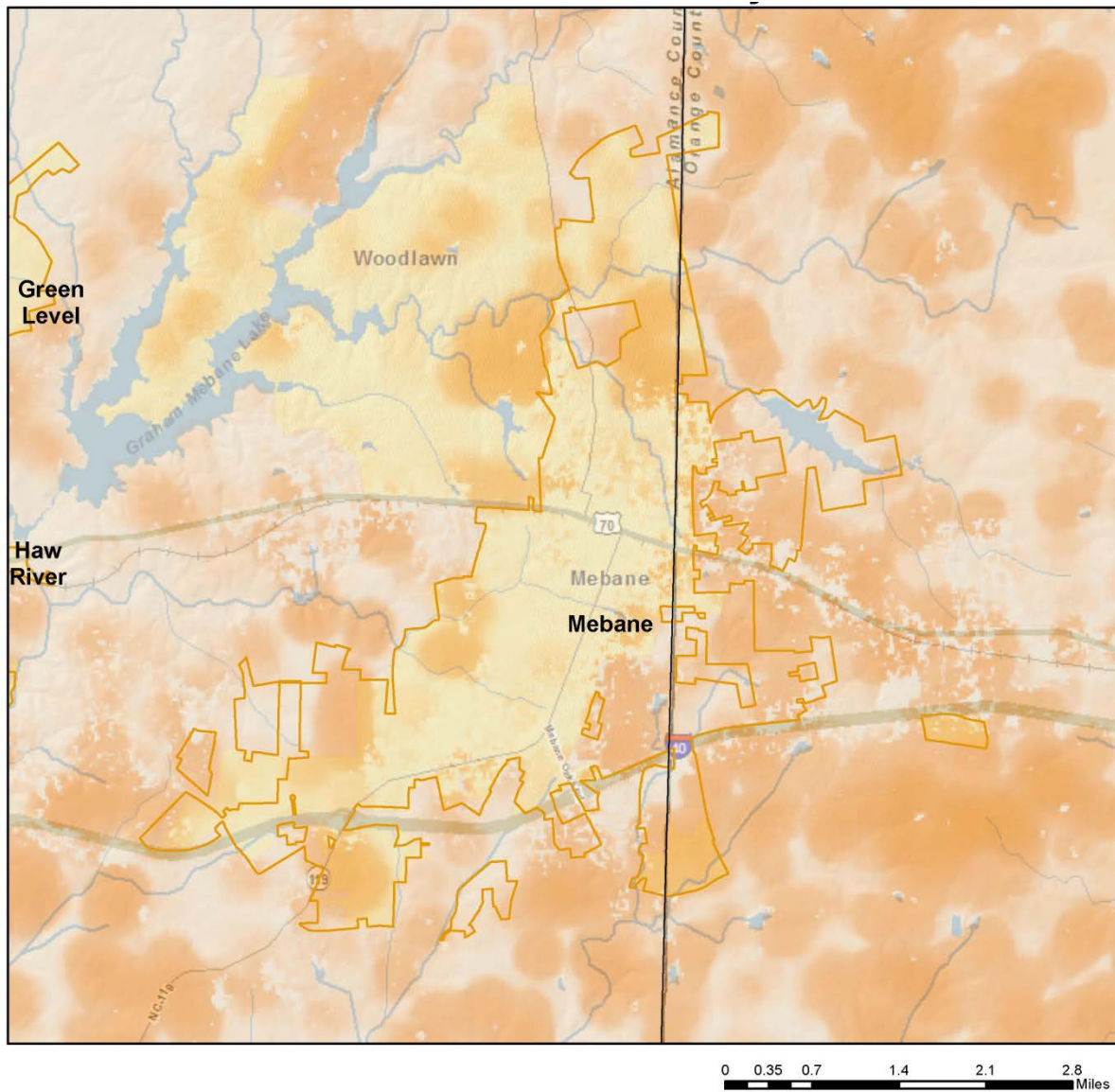


Figure 4.40: Wildfire Hazard Areas in the Town of Ossipee

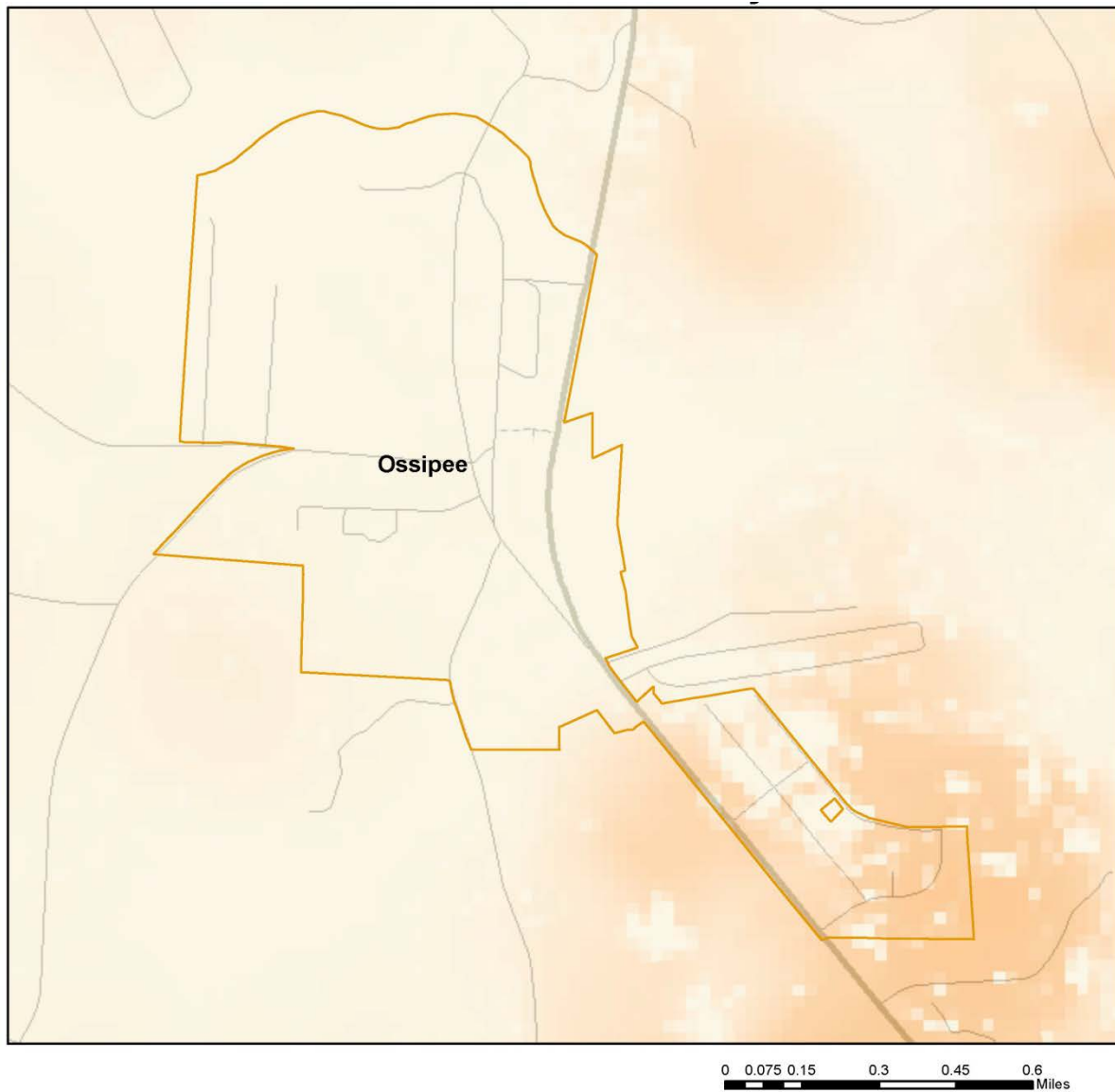


Figure 4.41: Wildfire Hazard Areas in the Town of Swebsonville

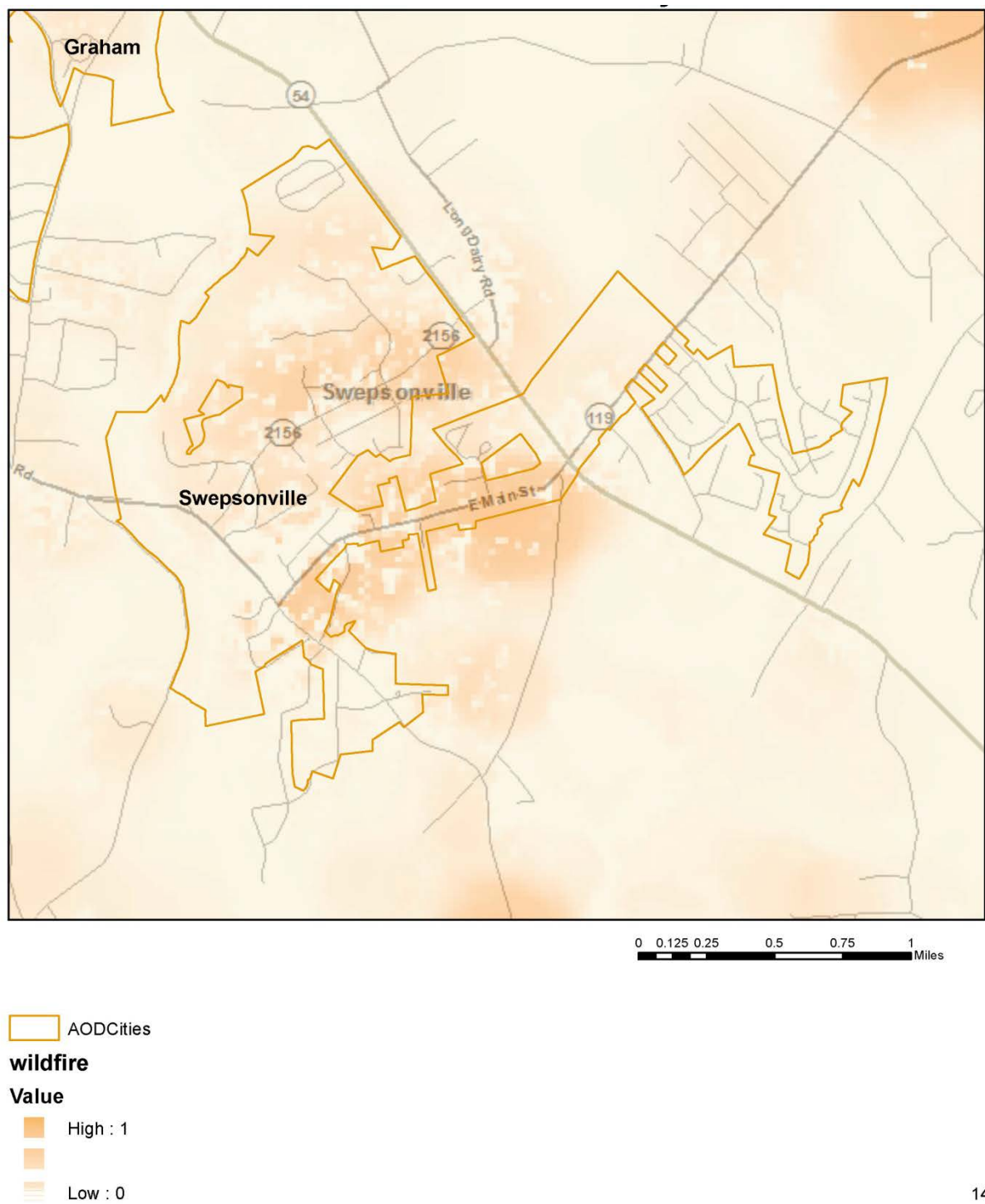
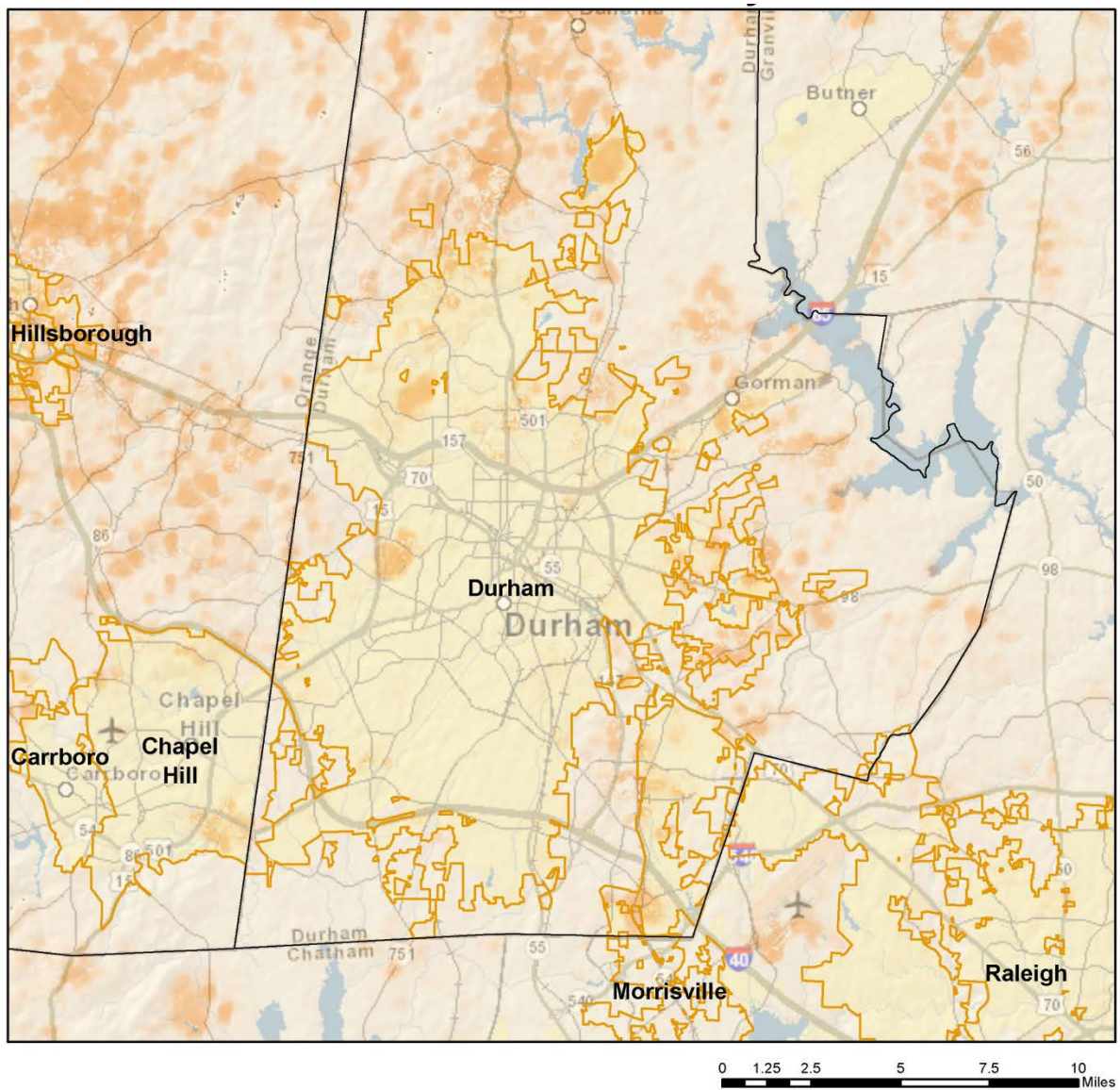


Figure 4.42: Wildfire Hazard Areas in the City of Durham



1

Figure 4.43: Wildfire Hazard Areas in the Town of Carrboro

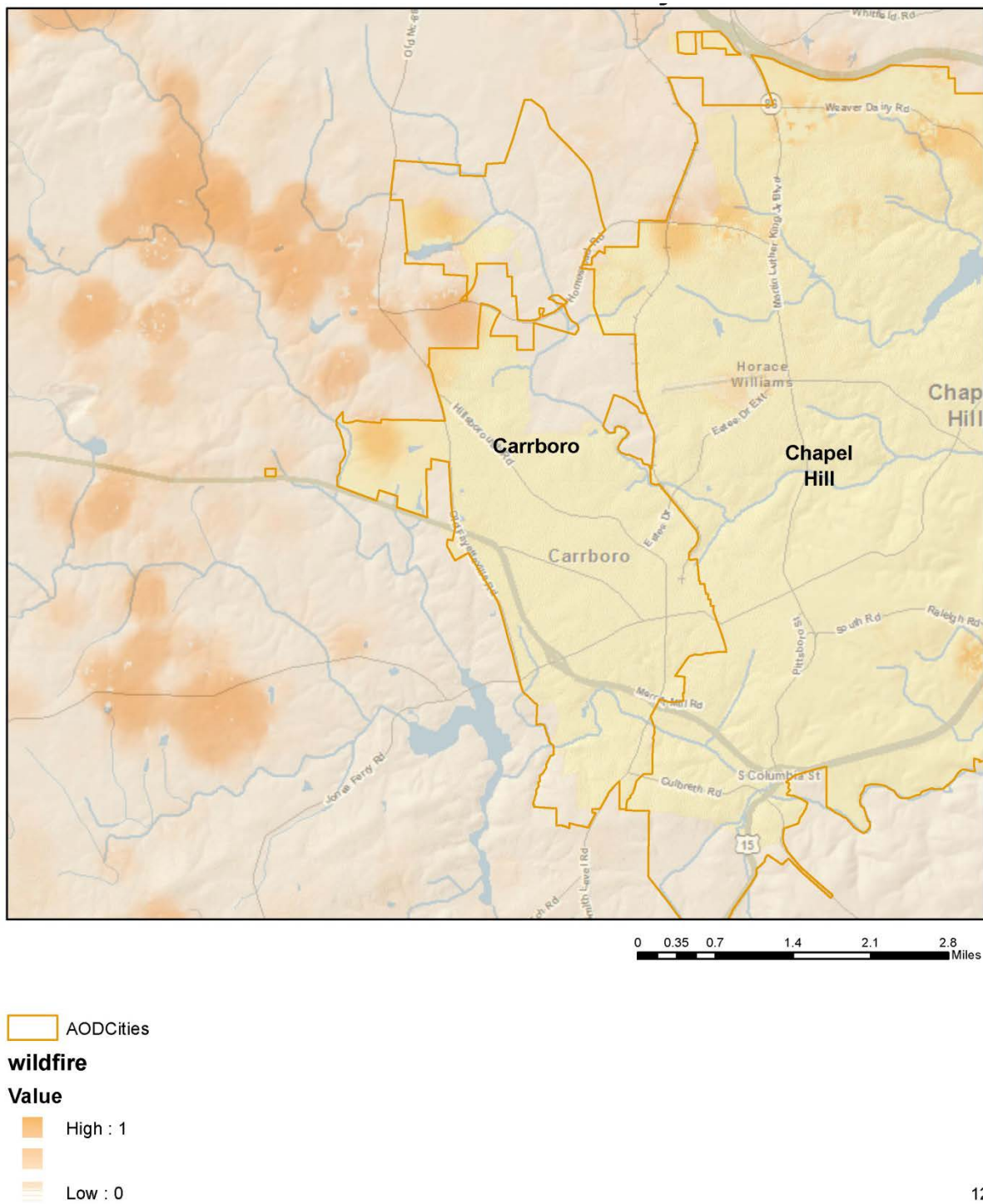


Figure 4.44: Wildfire Hazard Areas in the Town of Chapel Hill

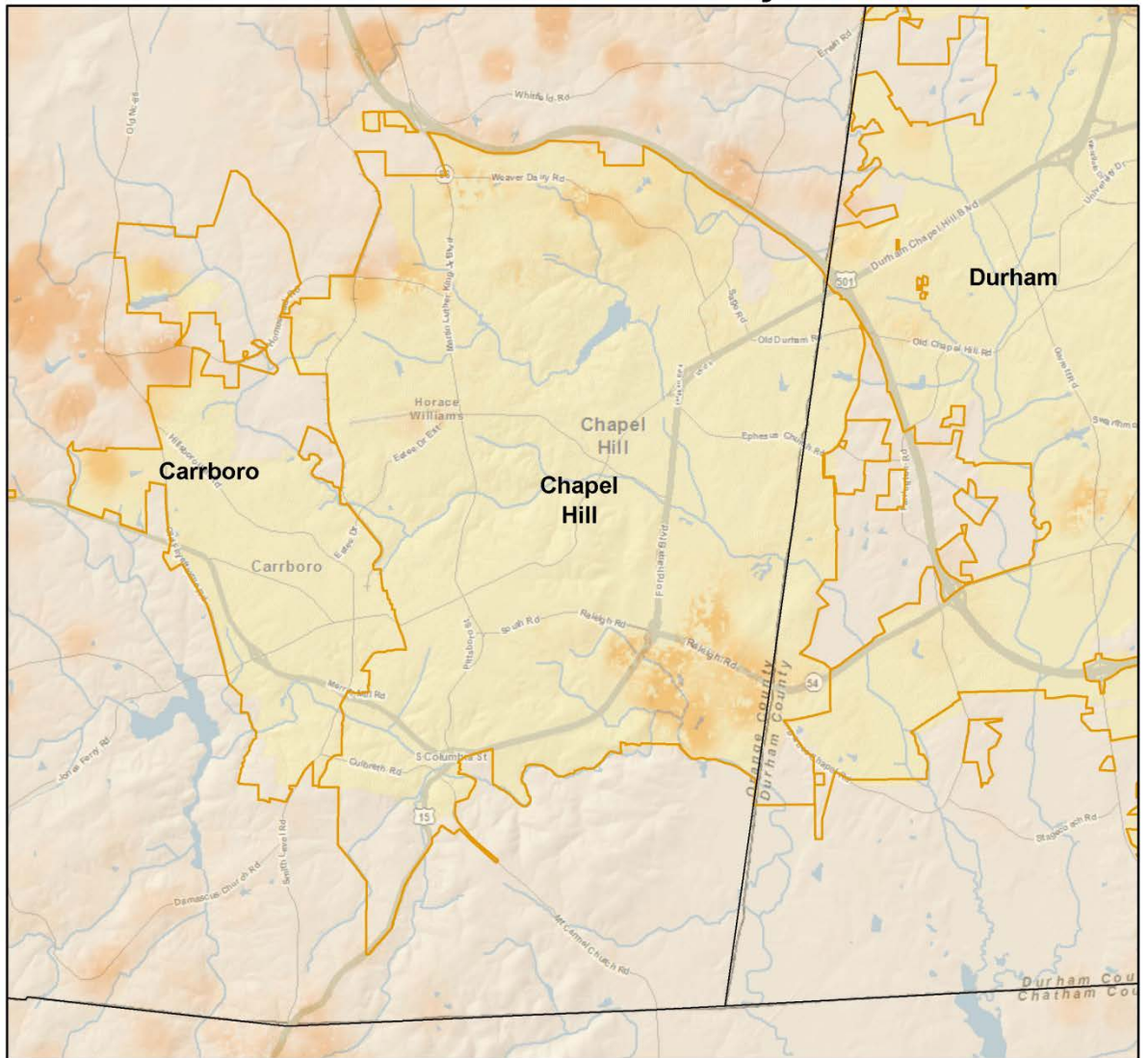
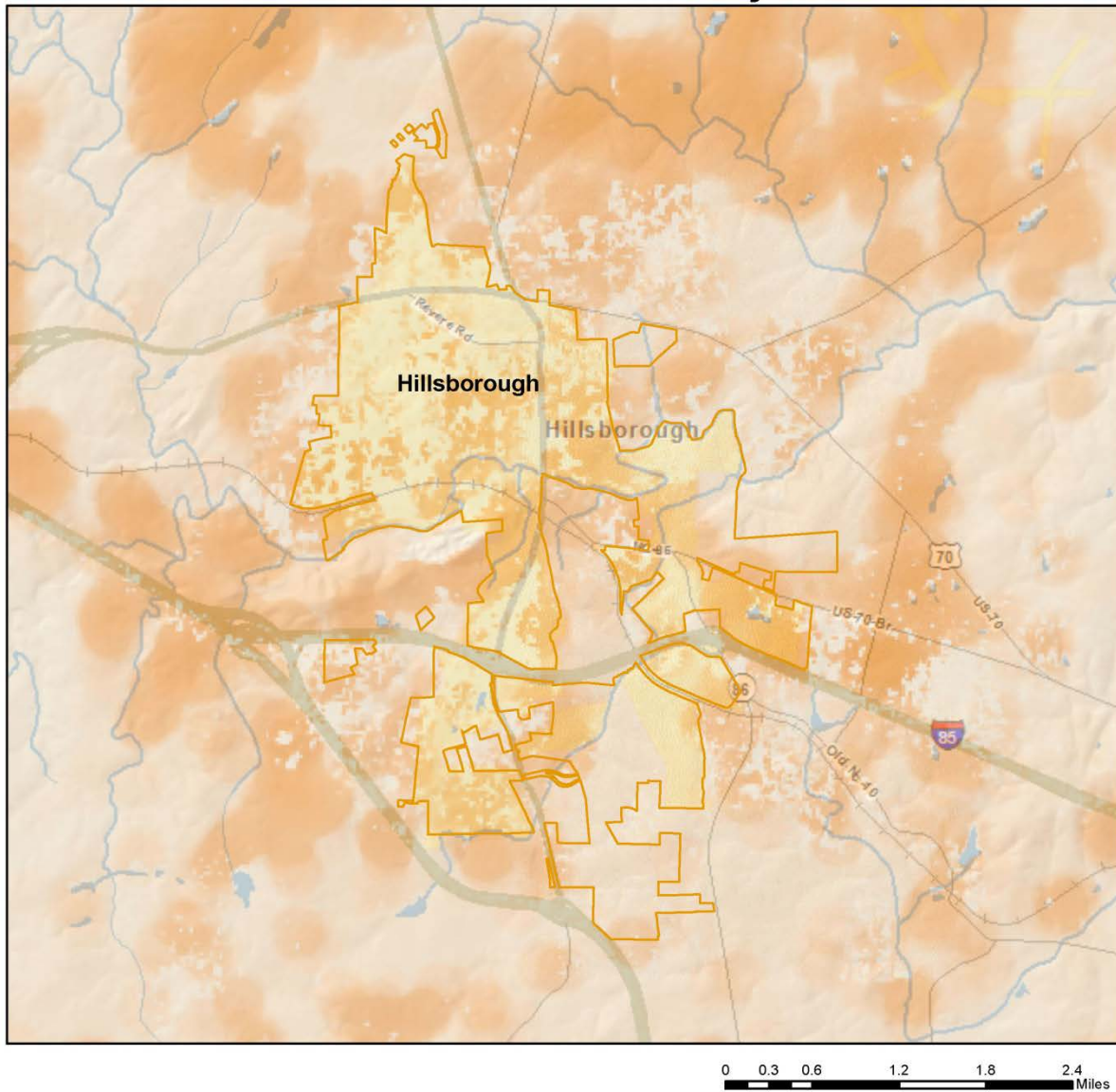


Figure 4.45: Wildfire Hazard Areas in the Town of Hillsborough



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Wildfire Hazard Vulnerability

The following tables provide counts and values by jurisdiction relevant to wildfire hazard vulnerability in the Eno-Haw Region.

Table 4.32: Exposure to Wildfire High Hazard Areas

Jurisdiction	Number of Developed Parcels At Risk		Number of Undeveloped Parcels At Risk		Number of Buildings At Risk		Value of Buildings At Risk	Population At Risk		Elderly Population At Risk		Children At Risk	
	Num	Per	Num	Per	Num	Per		Num	Per	Num	Per	Num	Per
Alamance County (Unincorporated)	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Alamance	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Burlington	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Elon	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Graham	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Green Level	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Haw River	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Mebane	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Ossipee	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Swepsonville	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
<i>Subtotal Alamance</i>	<i>0</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>	<i>\$0</i>	<i>0</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>
Orange County (Unincorporated)	26	0.1%	184	0.7%	130	0.4%	\$14,515,795	274	0.5%	30	0.5%	13	0.5%
Carrboro	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Chapel Hill	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Hillsborough	0	0.0%	0	0.0%	0	0.3%	\$0	0	0.0%	0	0.0%	0	0.0%
<i>Subtotal Orange</i>	<i>26</i>	<i>0.1%</i>	<i>184</i>	<i>0.4%</i>	<i>130</i>	<i>0.0%</i>	<i>\$14,515,795</i>	<i>274</i>	<i>0.2%</i>	<i>30</i>	<i>0.2%</i>	<i>13</i>	<i>0.2%</i>
Durham County (Unincorporated)	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Durham	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
<i>Subtotal Durham</i>	<i>0</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>	<i>\$0</i>	<i>0</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>	<i>0</i>	<i>0.0%</i>
TOTAL ENO-HAW	26	0.01%	184	0.1%	130	0.1	\$14,515,795	274	0.0%	30	0.0%	13	0.0%

Table 4.33: Exposure to Wildfire Moderate Hazard Areas

Jurisdiction	Number of Developed Parcels At Risk		Number of Undeveloped Parcels At Risk		Number of Buildings At Risk		Value of Buildings At Risk	Population At Risk		Elderly Population At Risk		Children At Risk	
	Num	Per	Num	Per	Num	Per		Num	Per	Num	Per	Num	Per
Alamance County (Unincorporated)	714	2.2%	215	0.7%	925	2.2%	\$119,973,287	1,727	2.9%	271	3.2%	100	3.0%
Alamance	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Burlington	1	0.0%	12	0.1%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Elon	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Graham	6	0.1%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Green Level	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Haw River	13	1.2%	0	0.0%	8	0.5%	\$4,075,072	12	0.5%	2	0.6%	1	0.4%
Mebane	171	3.4%	230	4.5%	144	3.6%	\$106,171,352	301	2.6%	33	2.5%	23	2.7%
Ossipee	5	1.8%	3	1.1%	3	0.8%	\$402,012	0	0.0%	0	0.0%	0	0.0%
Swepsonville	0	0.0%	2	0.3%	5	0.8%	\$636,251	12	1.1%	2	1.0%	1	1.4%
<i>Subtotal Alamance</i>	<i>910</i>	<i>1.3%</i>	<i>262</i>	<i>0.7%</i>	<i>1,085</i>	<i>1.3%</i>	<i>\$231,257,974</i>	<i>2,053</i>	<i>1.4%</i>	<i>308</i>	<i>1.4%</i>	<i>125</i>	<i>1.3%</i>
Orange County (Unincorporated)	2,100	7.4%	851	3.0%	2,363	8.2%	\$225,430,321	4,155	8.2%	449	7.7%	199	6.8%
Carrboro	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Chapel Hill	0	0.0%	0	0.0%	0	0.0%	\$0	0	0.0%	0	0.0%	0	0.0%
Hillsborough	227	7.9%	59	2.1%	136	4.8%	\$36,998,046	234	3.8%	29	3.8%	17	3.8%
<i>Subtotal Orange</i>	<i>2,327</i>	<i>4.7%</i>	<i>910</i>	<i>1.8%</i>	<i>2,499</i>	<i>4.9%</i>	<i>\$262,428,367</i>	<i>4,389</i>	<i>3.3%</i>	<i>478</i>	<i>3.7%</i>	<i>216</i>	<i>3.1%</i>
Durham County (Unincorporated)	709	3.2%	176	0.8%	862	3.5%	\$165,903,998	1,267	3.2%	134	2.2%	91	4.1%
Durham	267	0.3%	33	0.0%	229	0.3%	\$127,761,218	489	0.2%	43	0.2%	38	0.2%
<i>Subtotal Durham</i>	<i>976</i>	<i>1.0%</i>	<i>209</i>	<i>0.2%</i>	<i>1,091</i>	<i>1.0%</i>	<i>\$293,665,216</i>	<i>1,756</i>	<i>0.7%</i>	<i>177</i>	<i>0.7%</i>	<i>129</i>	<i>0.7%</i>
TOTAL ENO-HAW	4,213	1.9%	1,581	0.7%	4,675	2.0%	\$787,351,557	8,198	1.5%	963	1.6%	470	1.3%

4.6 Conclusions on Hazard Risk

Based on consensus of the Hazard Mitigation Planning Team, primarily at the third HMPT meeting, in addition to the results presented in this *Risk Assessment*, the hazards addressed in this plan have been ranked according to the following prioritized list:

High Risk Hazards

- Flood
- Winter Weather
- Hurricane and Tropical Storm

Moderate Risk Hazards

- Drought/Extreme Heat
- Thunderstorm, Lightning, and Hail
- Dam/Levee Failure
- Tornado

Low Risk Hazards

- Wildfire
- Earthquake
- Landslide

The HMPT has agreed to focus on the high and moderate risk hazards identified above for purposes of mitigation strategy development. The list above is also consistent with Annualized Loss Estimates (ALEs) calculated for the planning area which point to four of the same hazards, although in a slightly different order:

- Hurricane and Tropical Storm
- Flood
- Tornado
- Thunderstorm, Lightning, and Hail

In addition to the results presented throughout this *Risk Assessment*, the annualized losses presented in **Table 4.34** and summarized above further help substantiate the priority ranking stated here in these conclusions on hazard risk.

Table 4.34: Annualized Loss Estimates (ALEs) by Hazard by Jurisdiction

Jurisdiction	Flood	Dam/Levee Failure	Drought/ Extreme Heat	Thunderstorm, Lightning, and Hail	Tornado	Winter Weather	Hurricane and Tropical Storm	Landslide	Earthquake	Wildfire
Alamance County	\$26,316	NA	Neg	\$7,585	\$15,846	Neg	\$158,078,947	NA	NA	NA
Alamance	Neg	NA	NA	Neg	NA	NA	NA	NA	NA	NA
Burlington	Neg	NA	NA	Neg	NA	NA	NA	NA	NA	NA
Elon	Neg	NA	NA	\$5,123	NA	NA	NA	NA	NA	NA
Graham	Neg	NA	NA	Neg	NA	NA	NA	NA	NA	NA
Green Level	Neg	NA	NA	Neg	NA	NA	NA	NA	NA	NA
Haw River	Neg	NA	NA	Neg	NA	NA	NA	NA	NA	NA
Mebane	\$73,684	NA	NA	Neg	NA	NA	NA	NA	NA	NA
Ossipee	Neg	NA	NA	Neg	NA	NA	NA	NA	NA	NA
Sweepsonville	Neg	NA	NA	Neg	NA	NA	NA	NA	NA	NA
<i>Subtotal Alamance</i>	<i>\$100,000</i>	<i>NA</i>	<i>Neg</i>	<i>\$12,708</i>	<i>\$15,846</i>	<i>Neg</i>	<i>\$158,078,947</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
Orange County	\$8,421	NA	Neg	Neg	Neg	Neg	Neg	NA	NA	NA
Carrboro	Neg	NA	NA	Neg	Neg	NA	NA	NA	NA	NA
Chapel Hill	\$552,632	NA	NA	\$37,931	NA	NA	NA	NA	NA	NA
Hillsborough	Neg	NA	NA	Neg	NA	NA	NA	NA	NA	NA
<i>Subtotal Orange</i>	<i>\$561,053</i>	<i>NA</i>	<i>Neg</i>	<i>\$37,931</i>	<i>Neg</i>	<i>Neg</i>	<i>Neg</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
Durham County	\$8,421	NA	Neg	\$6,892	\$436,538	Neg	\$10,789	NA	NA	NA
Durham	Neg	NA	NA	Neg	NA	NA	NA	NA	NA	NA
<i>Subtotal Durham</i>	<i>\$8,421</i>	<i>NA</i>	<i>Neg</i>	<i>\$6,892</i>	<i>\$436,538</i>	<i>Neg</i>	<i>\$10,789</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
Total Eno-Haw	\$669,474	NA	Neg	\$57,531	\$452,384	Neg	\$158,089,736	NA	NA	NA

*"Neg" = "Negligible" which indicates that historical losses were less than \$5,000.

*"NA" = "Not Applicable" which indicates that an ALE is only applicable at the county level or that historical losses were unavailable.

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Section 5: Capability Assessment

This section discusses the capability of the Eno-Haw Region to implement hazard mitigation activities. It consists of the following four subsections:

- 5.1 Overview
- 5.2 Conducting the Capability Assessment
- 5.3 Capability Assessment Findings
- 5.4 Conclusions on Local Capability

5.1 Overview

The purpose of conducting a *Capability Assessment* is to determine the ability of a local jurisdiction to implement a comprehensive *Mitigation Strategy*, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs, or projects. As in any planning process, it is important to try to establish which goals and actions are feasible, based on an understanding of the organizational capacity of those agencies or departments tasked with their implementation. A *Capability Assessment* helps to determine which mitigation actions are practical and likely to be implemented over time given a local government's planning and regulatory framework, level of administrative and technical support, amount of fiscal resources, and current political climate.

A *Capability Assessment* has two primary components: (1) an inventory of a local jurisdiction's relevant plans, ordinances, and programs already in place; and (2) an analysis of its capacity to carry them out. Careful examination of local capabilities will detect any existing gaps, shortfalls, or weaknesses with ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. A *Capability Assessment* also highlights the positive mitigation measures already in place or being implemented at the local government level, which should continue to be supported and enhanced through future mitigation efforts.

The *Capability Assessment* completed for the Eno-Haw Region serves as a critical planning step and an integral part of the foundation for designing an effective *Mitigation Strategy*. Coupled with the *Risk Assessment*, the *Capability Assessment* helps identify and target meaningful mitigation actions for incorporation into the *Mitigation Strategy* portion of the Plan. It not only helps establish the goals for the Region to pursue under this Plan, but also ensures that those goals are realistically achievable under given local conditions.

5.2 Conducting the Capability Assessment

In order to facilitate the inventory and analysis of local government capabilities within the Eno-Haw counties, a detailed *Local Capability Assessment Survey* was distributed to members of the Eno-Haw Hazard Mitigation Planning Team (HMPT) at the second planning committee meeting. The survey questionnaire requested information on a variety of "capability indicators" such as existing local plans, policies, programs, or ordinances that contribute to and/or hinder the Region's ability to implement hazard mitigation actions. Other indicators included information related to the Region's fiscal, administrative, and technical capabilities, such as access to local budgetary and personnel resources for mitigation purposes, as well as any existing education and outreach programs that can be used to promote mitigation. Survey respondents were also asked to comment

on the current political climate with respect to hazard mitigation, an important consideration for any local planning or decision making process.

At a minimum, the survey results provide an extensive and consolidated inventory of existing local plans, ordinances, programs, and resources in place or under development, in addition to their overall effect on hazard loss reduction. In completing the survey, local officials were also required to conduct a self assessment of their jurisdiction's specific capabilities. The survey instrument thereby not only helps accurately assess the degree of local capability, but it also serves as a good source of introspection for counties and local jurisdictions that want to improve their capabilities as identified gaps, weaknesses, or conflicts can be recast as opportunities for specific actions to be proposed as part of the *Mitigation Strategy*.

The information provided in response to the survey questionnaire was incorporated into a database for further analysis. A general scoring methodology was then applied to quantify each jurisdiction's overall capability. According to the scoring system, each capability indicator was assigned a point value based on its relevance to hazard mitigation. Additional points were added based on the jurisdiction's self assessment of their own planning and regulatory capability, administrative and technical capability, fiscal capability, education and outreach capability, and political capability.

Using this scoring methodology, a total score and an overall capability rating of "High," "Moderate," or "Limited" could be determined according to the total number of points received. These classifications are designed to provide nothing more than a general assessment of local government capability. In combination with the narrative responses provided by local officials, the results of this *Capability Assessment* provide critical information for developing an effective and meaningful mitigation strategy.

5.3 Capability Assessment Findings

The findings of the *Capability Assessment* are summarized in this Plan to provide insight into the relevant capacity of the Eno-Haw Region to implement hazard mitigation activities. All information is based upon the input provided by local government officials through the *Local Capability Assessment Survey* and during meetings of the HMPT.

5.3.1 Planning and Regulatory Capability

Planning and regulatory capability is based on the implementation of plans, ordinances, and programs that demonstrate a local jurisdiction's commitment to guiding and managing growth, development, and redevelopment in a responsible manner, while maintaining the general welfare of the community. It includes emergency response and mitigation planning, comprehensive land use planning, and transportation planning, in addition to the enforcement of zoning or subdivision ordinances and building codes that regulate how land is developed and structures are built, as well as protecting environmental, historic, and cultural resources in the community. Although some conflicts can arise, these planning initiatives generally present significant opportunities to integrate hazard mitigation principles and practices into the local decision making process.

This assessment is designed to provide a general overview of the key planning and regulatory tools or programs in place or under development for the Eno-Haw Region, along with their potential effect on loss reduction. This information will help identify opportunities to address existing gaps,

weaknesses, or conflicts with other initiatives in addition to integrating the implementation of this Plan with existing planning mechanisms where appropriate.

Table 5.1 provides a summary of the relevant local plans, ordinances, and programs already in place or under development for the Eno-Haw Region. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the Eno-Haw Regional Hazard Mitigation Plan.

Table 5.1: Relevant Plans, Ordinances, and Programs

Jurisdiction	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan	Stormwater Management Plan	Emergency Operations Plan	SARA Title III Plan	Radiological Emergency Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Transportation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Site Plan Review Requirements	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	Community Wildfire Protection Plan	National Flood Insurance Program	Community Rating System
Alamance County	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	
Alamance	✓	✓	✓		✓	✓	*	*	*	*	*	✓	*	✓	*	*	✓	✓	✓	✓		✓	✓		✓	
Burlington	✓	*				✓	✓	*	*	*	✓			✓		✓	✓	✓		*			✓		✓	
Elon	✓	✓	✓	✓	✓	✓	✓	*	✓	✓	✓	*			✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	
Graham	✓	✓		✓	✓							*		✓	✓	✓				✓		✓	✓		✓	
Green Level	✓	✓	✓	✓	✓	✓	*	*	*	*	✓	✓	*	*	*	✓	✓	✓	✓	✓	*	✓	✓	✓	✓	✓
Haw River	✓	✓	✓		✓	✓	✓	✓	✓	*	✓	*	*	*		✓	✓	✓	✓	*	*	✓	✓	✓	✓	
Mebane	✓	✓	✓		✓	✓	✓	✓	✓	*	✓	✓	✓	✓		✓	✓	✓	✓	✓	*	✓	✓	✓	✓	
Ossipee	✓	*				✓	✓	*	✓	✓	✓						✓	✓		*		✓	✓	✓		
Swepsonville	✓	✓	✓		✓	✓	✓	✓	✓	*	✓	*	*	*		✓	✓	✓		✓	✓		✓	✓	✓	
Orange County	✓	✓	✓	✓	✓	✓	*	*	*		*	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓
Carrboro	✓			✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	*
Chapel Hill	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	
Hillsborough	✓	✓	✓		✓	✓	✓		✓	*	*	✓	*	*	✓	✓	✓	✓	✓	✓	*	✓	✓	*	✓	
Durham County	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓		✓	✓	✓	✓	✓		✓	✓		✓	✓
Durham	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓		✓	✓	✓	✓	✓		✓	✓		✓	✓

Source: Local Capability Assessment Survey.

A more detailed discussion on the Region’s planning and regulatory capability follows, along with the incorporation of additional information based on the narrative comments provided by local officials in response to the survey questionnaire.

5.3.1.1 Emergency Management

Hazard mitigation is widely recognized as one of the four primary phases of emergency management. The three other phases are preparedness, response, and recovery. In reality each phase is interconnected with hazard mitigation, as **Figure 5.1** suggests. Opportunities to reduce potential losses through mitigation practices are most often implemented before a disaster event, such as elevation of flood-prone structures or through the continuous enforcement of policies that prevent and regulate development that is vulnerable to hazards because of its location, design, or other characteristics. Mitigation opportunities can also be identified during immediate preparedness or response activities (such as installing storm shutters in advance of a hurricane), and in many instances during the long-term recovery and redevelopment process following a disaster event.

Figure 5.1: The Four Phases of Emergency Management



Planning for each phase is a critical part of a comprehensive emergency management program and a key to the successful implementation of hazard mitigation actions. As a result, the *Local Capability Assessment Survey* asked several questions across a range of emergency management plans in order to assess the Eno-Haw Region’s willingness to plan and their level of technical planning proficiency.

Hazard Mitigation Plan

A hazard mitigation plan represents a community’s blueprint for how it intends to reduce the impact of natural, and in some cases human-caused, hazards on people and the built environment. The essential elements of a hazard mitigation plan include a risk assessment, capability assessment, and mitigation strategy.

- All of the jurisdictions participating in this regional planning effort have previously been covered by their county’s multi-jurisdictional hazard mitigation plan.

Disaster Recovery Plan

A disaster recovery plan serves to guide the physical, social, environmental, and economic recovery and reconstruction process following a disaster event. In many instances, hazard mitigation principles and practices are incorporated into local disaster recovery plans with the intent of capitalizing on opportunities to break the cycle of repetitive disaster losses. Disaster recovery plans can also lead to the preparation of disaster redevelopment policies and ordinances to be enacted following a hazard event.

- 14 of the participating jurisdictions have a disaster recovery plan either in place or under development. (10 jurisdictions have one in place; 4 have one under development.)

Emergency Operations Plan

An emergency operations plan outlines responsibilities and the means by which resources are deployed during and following an emergency or disaster.

- 14 of the participating jurisdictions have an emergency operations plan in place.

Continuity of Operations Plan

A continuity of operations plan establishes a chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster event.

- 13 of the participating jurisdictions have a continuity of operations plan either in place or under development. (9 jurisdictions have one in place; 4 have one under development.)

5.3.1.2 General Planning

The implementation of hazard mitigation activities often involves agencies and individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists, and others. In many instances, concurrent local planning efforts will help to achieve or complement hazard mitigation goals, even though they are not designed as such. Therefore, the *Local Capability Assessment Survey* also asked questions regarding general planning capabilities and the degree to which hazard mitigation is integrated into other ongoing planning efforts in the Eno-Haw Region.

Comprehensive/General Plan

A comprehensive land use plan, or general plan, establishes the overall vision for what a community wants to be and serves as a guide for future governmental decision making. Typically a comprehensive plan contains sections on demographic conditions, land use, transportation elements, and community facilities. Given the broad nature of the plan and its regulatory standing in many communities, the integration of hazard mitigation measures into the comprehensive plan can enhance the likelihood of achieving risk reduction goals, objectives, and actions.

- 14 of the participating jurisdictions have a comprehensive land use plan either in place or under development (12 have one in place; 2 have one under development.)

Capital Improvements Plan

A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism for guiding future development away

from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- 13 of the participating jurisdictions have a capital improvements plan in place or under development.

Historic Preservation Plan

A historic preservation plan is intended to preserve historic structures or districts within a community. An often overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards, and the identification of ways to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards, or are within a historic district that cannot easily be relocated out of harm's way.

- 12 of the participating jurisdictions have an historic preservation plan in place or under development.

Zoning Ordinance

Zoning represents the primary means by which land use is controlled by local governments. As part of a community's police power, zoning is used to protect the public health, safety, and welfare of those in a given jurisdiction that maintains zoning authority. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, a zoning ordinance can serve as a powerful tool when applied in identified hazard areas.

- 13 of the participating jurisdictions have a zoning ordinance in place or under development.

Subdivision Ordinance

A subdivision ordinance is intended to regulate the development of residential, commercial, industrial, or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.

- 14 of the participating jurisdictions have a subdivision ordinance in place or under development.

Building Codes, Permitting, and Inspections

Building codes regulate construction standards. In many communities, permits and inspections are required for new construction. Decisions regarding the adoption of building codes (that account for hazard risk), the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- 13 of the participating jurisdictions have building codes in place.

The adoption and enforcement of building codes by local jurisdictions is routinely assessed through the Building Code Effectiveness Grading Schedule (BCEGS) program, developed by the Insurance Services Office, Inc. (ISO). In North Carolina, the North Carolina Department of Insurance assesses the building codes in effect in a particular community and how the community enforces its building codes, with special emphasis on mitigation of losses from natural hazards. The results of BCEGS assessments are routinely provided to ISO's member private insurance companies, which in turn

may offer ratings credits for new buildings constructed in communities with strong BCEGS classifications. The concept is that communities with well-enforced, up-to-date codes should experience fewer disaster-related losses, and as a result should have lower insurance rates.

In conducting the assessment, ISO collects information related to personnel qualification and continuing education, as well as number of inspections performed per day. This type of information combined with local building codes is used to determine a grade for that jurisdiction. The grades range from 1 to 10, with a BCEGS grade of 1 representing exemplary commitment to building code enforcement, and a grade of 10 indicating less than minimum recognized protection.

5.3.1.3 Floodplain Management

Flooding represents the greatest natural hazard facing the nation. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. In addition to approaches that cut across hazards such as education, outreach, and the training of local officials, the National Flood Insurance Program (NFIP) contains specific regulatory measures that enable government officials to determine where and how growth occurs relative to flood hazards. Participation in the NFIP is voluntary for local governments; however, program participation is strongly encouraged by FEMA as a first step for implementing and sustaining an effective hazard mitigation program. It is therefore used as part of this *Capability Assessment* as a key indicator for measuring local capability.

In order for a county or municipality to participate in the NFIP, they must adopt a local flood damage prevention ordinance that requires jurisdictions to follow established minimum building standards in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by a 100-year flood event, and that new development in the floodplain will not exacerbate existing flood problems or increase damage to other properties.

A key service provided by the NFIP is the mapping of identified flood hazard areas. Once completed, the Flood Insurance Rate Maps (FIRMs) are used to assess flood hazard risk, regulate construction practices, and set flood insurance rates. FIRMs are an important source of information to educate residents, government officials, and the private sector about the likelihood of flooding in their community.

Table 5.2 provides NFIP policy and claim information for each participating jurisdiction in the Eno-Haw Region. The Town of Ossipee is not currently participating in the NFIP because there is very minimal Special Flood Hazard Area (SFHA) identified within its boundary, and there is no development in or near that area.

Table 5.2: NFIP Policy and Claim Information

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies In Force	Total Premiums	Insurance In Force	Closed Paid Losses	Total Payments
Alamance County	12/01/81	01/02/08	50	\$73,394	\$13,224,100	29	\$824,802
Alamance	08/15/90	01/02/08	2	\$874	\$700,000	0	\$0
Burlington	04/01/81	01/02/08	145	\$126,096	\$32,199,800	26	\$251,614
Elon	06/05/89	01/02/08	24	\$14,052	\$5,075,300	2	\$12,790
Graham	11/19/80	01/02/08	43	\$25,007	\$8,339,500	8	\$63,753
Green Level	12/22/98	01/02/08	0	\$0	\$0	0	\$0
Haw River	11/05/80	01/02/08	6	\$6,597	\$1,278,100	1	\$60,000
Mebane	11/05/80	01/02/08	44	\$22,905	\$10,948,100	2	\$4,622
Ossipee	-	-	0	\$0	\$0	0	\$0
Swepsonville	12/01/81	01/02/08	3	\$1,467	\$531,400	0	\$0
<i>Subtotal Alamance</i>	-	-	317	\$270,392	\$72,296,300	68	\$1,217,581
Orange County	03/16/81	05/16/08	85	\$38,931	\$22,903,400	8	\$179,620
Carrboro	06/30/76	05/16/08	106	\$56,325	\$27,308,100	7	\$62,338
Chapel Hill	04/17/78	05/16/08	644	\$567,744	\$141,166,700	170	\$7,713,132
Hillsborough	05/15/80	05/16/08	16	\$13,731	\$3,826,500	3	\$9,032
<i>Subtotal Orange</i>	-	-	851	\$676,731	\$195,204,700	188	\$7,964,122
Durham County	02/15/79	05/16/08	223	\$146,331	\$54,636,000	40	\$505,362
Durham	01/03/79	05/16/08	1,129	\$936,955	\$256,244,000	123	\$1,568,822
<i>Subtotal Durham</i>	-	-	1,352	\$1,083,286	\$310,880,000	163	\$2,074,184
TOTAL ENO-HAW	-	-	2,520	\$2,030,409	\$578,381,000	419	\$11,255,887

Source: FEMA NFIP Policy Statistics (10/31/2014).

Community Rating System

An additional indicator of floodplain management capability is the active participation of local jurisdictions in the Community Rating System (CRS). The CRS is an incentive-based program that encourages counties and municipalities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP, adding extra local measures to provide protection from flooding. All of the 18 creditable CRS mitigation activities are assigned a range of point values. As points are accumulated and reach identified thresholds, communities can apply for an improved CRS class. Class ratings, which range from 10 to 1, are tied to flood insurance premium reductions as shown in **Table 5.3**. As class ratings improve (the lower the number, the better), the percent reduction in flood insurance premiums for NFIP policyholders in that community increases.

Table 5.3: CRS Premium Discounts, By Class

CRS Class	Premium Reduction
1	45%
2	40%
3	35%
4	30%
5	25%
6	20%
7	15%
8	10%
9	5%
10	0%

Source: NFIP Community Rating System.

Community participation in the CRS is voluntary. Any community that is in full compliance with the rules and regulations of the NFIP may apply to FEMA for a CRS classification better than class 10. The CRS application process has been greatly simplified over the past several years, based on community comments intended to make the CRS more user friendly, and extensive technical assistance available for communities who request it.

- Orange County, Durham County, and the City of Durham participate in the CRS, each with a class of 8.

Floodplain Management Plan

A floodplain management plan (or a flood mitigation plan) provides a framework for action regarding corrective and preventative measures to reduce flood-related impacts.

- 12 of the participating jurisdictions have a floodplain management plan in place.

Open Space Management Plan

An open space management plan is designed to preserve, protect, and restore largely undeveloped lands in their natural state, and to expand or connect areas in the public domain such as parks, greenways, and other outdoor recreation areas. In many instances open space management practices are consistent with the goals of reducing hazard losses, such as the preservation of wetlands or other flood-prone areas in their natural state in perpetuity.

- 8 of the participating jurisdictions have an open space management plan in place.

Stormwater Management Plan

A stormwater management plan is designed to address flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

- 13 of the participating jurisdictions have a stormwater management plan in place.

5.3.2 Administrative and Technical Capability

The ability of a local government to develop and implement mitigation projects, policies, and programs is directly tied to its ability to direct staff time and resources for that purpose. Administrative capability can be evaluated by determining how mitigation-related activities are assigned to local departments and if there are adequate personnel resources to complete these activities. The degree of intergovernmental coordination among departments will also affect administrative capability for the implementation and success of proposed mitigation activities.

Technical capability can generally be evaluated by assessing the level of knowledge and technical expertise of local government employees, such as personnel skilled in using geographic information systems (GIS) to analyze and assess community hazard vulnerability. The *Local Capability Assessment Survey* was used to capture information on administrative and technical capability through the identification of available staff and personnel resources.

Table 5.4 provides a summary of the *Local Capability Assessment Survey* results for the Eno-Haw Region with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Table 5.4: Relevant Staff/Personnel Resources

Jurisdiction	Planners with knowledge of land development and land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Building Official	Emergency manager	Floodplain manager	Land surveyors	Scientist familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in Geographic Information Systems (GIS) and/or HAZUS	Resource development staff or grant writers	Maintenance programs to reduce risk	Warning systems/services	Mutual Aid Agreements
Alamance County	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓
Alamance	✓					✓				✓		✓	✓	
Burlington	✓		✓		✓	✓			✓	✓			✓	
Elon	✓	✓		✓	✓	✓	✓			✓		✓		✓
Graham	✓	✓		✓		✓	✓			✓	✓	✓		✓
Green Level	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
Haw River	✓	✓	✓	✓		✓	✓					✓		✓
Mebane	✓	✓	✓	✓		✓	✓					✓	✓	✓
Ossipee					✓								✓	✓
Swepsonville						✓							✓	✓
Orange County	✓	✓	✓	✓	✓	✓			✓	✓			✓	✓
Carrboro	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Chapel Hill	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hillsborough	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓
Durham County	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Durham	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Source: Local Capability Assessment Survey.

5.3.3 Fiscal Capability

The ability of a local government to take action is often closely associated with the amount of money available to implement policies and projects. This may take the form of outside grant funding awards or locally based revenue and financing. The costs associated with mitigation policy and project implementation vary widely. In some cases, policies are tied primarily to staff time or administrative costs associated with the creation and monitoring of a given program. In other cases, direct expenses are linked to an actual project such as the acquisition of flood-prone houses, which can require a substantial commitment from local, state, and federal funding sources.

The *Local Capability Assessment Survey* was used to capture information on the Region's fiscal capability through the identification of locally available financial resources.

Table 5.5 provides a summary of the results for the Eno-Haw Region with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

Table 5.5: Relevant Fiscal Resources

Jurisdiction	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation Bonds	Revenue Bonds	Special Tax Bonds	Other
Alamance County	✓	✓						✓			
Alamance	✓	✓	✓		✓	✓		✓	✓	✓	✓
Burlington											
Elon	✓	✓			✓	✓		✓	✓		
Graham	✓				✓	✓					
Green Level	✓				✓	✓					
Haw River	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Mebane	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Ossipee			✓		✓						
Sweepsonville	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Orange County	✓	✓	✓		✓			✓			
Carrboro	✓							✓			
Chapel Hill	✓	✓				✓		✓	✓		
Hillsborough	✓		✓		✓	✓					✓
Durham County	✓				✓	✓			✓		
Durham	✓				✓	✓			✓		

Source: Local Capability Assessment Survey.

5.3.4 Education and Outreach Capability

This type of local capability refers to education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Examples include natural disaster or safety related school programs; participation in community programs such as Firewise or StormReady; and activities conducted as part of hazard awareness campaigns such as a Tornado Awareness Month.

Table 5.6 provides a summary of the results for the Eno-Haw Region with regard to relevant education and outreach resources. A checkmark (✓) indicates that the given resource is locally available for hazard mitigation purposes.

Table 5.6: Education and Outreach Resources

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Natural disaster or safety related school programs	StormReady certification	Firewise Communities certification	Public-private partnership initiatives addressing disaster-related issues	Other
Alamance County	✓	✓	✓			✓	
Alamance		✓					
Burlington				✓			
Elon		✓	✓				
Graham		✓					
Green Level							
Haw River		✓					
Mebane		✓					
Ossipee							
Sweepsonville		✓					
Orange County							
Carrboro	✓	✓	✓			✓	
Chapel Hill	✓	✓	✓			✓	
Hillsborough	✓	✓	✓				
Durham County	✓	✓	✓	✓		✓	
Durham	✓	✓	✓	✓		✓	

Source: Local Capability Assessment Survey.

5.3.5 Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to reduce the impact of future hazard events. Hazard mitigation may not be a local priority, or may conflict with or be seen as an impediment to other goals of the community, such as growth and economic development. Therefore the local political climate must be considered in designing mitigation strategies, as it could be the most difficult hurdle to overcome in accomplishing their adoption and implementation.

The *Local Capability Assessment Survey* was used to capture information on political capability of the Eno-Haw Region. Survey respondents were asked to identify some general examples of local political capability, such as guiding development away from identified hazard areas, restricting public investments or capital improvements within hazard areas, or enforcing local development standards that go beyond minimum state or federal requirements (e.g., building codes, floodplain management, etc.). The comments provided by the participating jurisdictions are listed below:

- The Alamance County Local Emergency Planning Committee (LEPC), in conjunction with various businesses and industries, works with our local Board of Directors and Alamance County Commissioners to enact policies/procedures and ordinances that may go beyond State requirements (Chemical Planner position, assessing HazMat fees in the County to businesses who store, manufacture, or produce hazardous chemicals, wastes, etc.).
- The Town of Carrboro has participated in the National Flood Insurance Program (NFIP) for nearly four decades. The Town has an outstanding commitment to development management and environmental protection; regulatory and policy measures exceed minimum state and federal requirements related to use of stream buffers and floodplains, including building construction. Regulations and policies have been framed to maximize the suitability of development in relation to natural constraints, minimize environmental degradation and reduce long-term costs and impacts of development on natural systems and owners of real property. The Town has invested heavily in the establishment and maintenance of base data that allows clear communication between residents, property owners, public officials, and the development community. The Town has pursued grant funds to provide relief in locations where nonconforming development preceded the establishment of more stringent flood protection measures, has requested special flood studies beyond the limits of those required by FEMA, and has carried out its own engineering investigations, outreach, and analyses to identify solutions to existing areas of concern.¹
- The Town of Chapel Hill has significant political capability to enact policies and programs to reduce community hazards. Examples include considerations in the Unified Development Ordinance to include riparian buffers and storm water collection. In addition the fire prevention takes an aggressive approach in mitigating and preventing hazards.
- Along with the adoption of various planning and zoning ordinances, the Hillsborough Town Commissioners have seen fit to adopt a Fire Prevention Ordinance that includes a Hazardous Materials Control provision and a mandatory Fire Sprinkler provision.

¹ See <https://carrboro.legistar.com/LegislationDetail.aspx?ID=1492083&GUID=0C706CC1-1998-45D6-8C8C-2A3C1E537E41&Options=ID|Text|&Search=flooding> and <https://carrboro.legistar.com/LegislationDetail.aspx?ID=1903520&GUID=69FDA95E-0247-41A3-8167-A3A4D2C6CA6B&Options=ID|Text|&Search=flooding> for examples.

5.3.6 Local Self Assessment

In addition to the inventory and analysis of specific local capabilities, the *Local Capability Assessment Survey* asked counties and local jurisdictions within the Eno-Haw Region to conduct a self assessment of their perceived capability to implement hazard mitigation activities. As part of this process, local officials were encouraged to consider the barriers to implementing proposed mitigation strategies in addition to the mechanisms that could enhance or further such strategies. In response to the survey questionnaire, county officials classified each of the aforementioned capabilities as either “limited,” “moderate,” or “high.”

Table 5.7 summarizes the results of the self assessment for the Eno-Haw Region.

Table 5.7: Self Assessment of Capability

Jurisdiction	Plans, Ordinances, Codes and Programs	Administrative and Technical Capability	Fiscal Capability	Education and Outreach Capability	Political Capability	OVERALL CAPABILITY
Alamance County	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE
Alamance	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
Burlington	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE
Elon	LIMITED	LIMITED	LIMITED	LIMITED	MODERATE	LIMITED
Graham	MODERATE	MODERATE	LIMITED	MODERATE	MODERATE	MODERATE
Green Level	MODERATE	HIGH	MODERATE	LIMITED	LIMITED	MODERATE
Haw River	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE
Mebane	LIMITED	LIMITED	LIMITED	LIMITED	LIMITED	LIMITED
Ossipee						
Swepsonville	LIMITED	MODERATE	MODERATE	LIMITED	MODERATE	MODERATE
Orange County	-	-	-	-	-	-
Carrboro	HIGH	HIGH	MODERATE	HIGH	MODERATE	HIGH
Chapel Hill	HIGH	HIGH	MODERATE	HIGH	MODERATE	HIGH
Hillsborough	HIGH	MODERATE	LIMITED	MODERATE	MODERATE	MODERATE
Durham County	HIGH	HIGH	MODERATE	HIGH	MODERATE	MODERATE
Durham	HIGH	HIGH	MODERATE	HIGH	MODERATE	MODERATE

Source: Local Capability Assessment Survey.

5.4 Conclusions on Local Capability

In order to form meaningful conclusions on the assessment of local capability, a scoring system was designed and applied to the results of the *Local Capability Assessment Survey*. This approach, further described below, assesses the level of capability for each jurisdiction in the Eno-Haw Region. It is important to note that the score received by each participating jurisdiction is not intended to compare one to the other. Rather, the scoring system is intended to assist each jurisdiction to develop mitigation actions that reflect their abilities and help to identify areas that can be improved through the adoption of specific mitigation actions addressing these weaknesses.

Points System for Capability Ranking

Scoring:

0-24 points = Limited overall capability
25-55 points = Moderate overall capability
56-103 points = High overall capability

I. Planning and Regulatory Capability (Up to 55 points)

Yes=3 points Under Development or Under County Jurisdiction=1 No=0 points

- Hazard Mitigation Plan
- Comprehensive Land Use Plan
- Floodplain Management Plan
- Participate in the NFIP
- Participate in CRS Program
- BCEGS Grade of 1 to 5

Yes=2 points Under Development or County Jurisdiction=1 No=0 points

- Open Space Management / Parks & Rec. Plan
- Stormwater Management Plan
- Emergency Operations Plan
- SARA Title III
- Radiological Emergency Plan
- Continuity of Operations Plan
- Evacuation Plan
- Disaster Recovery Plan
- Flood Damage Prevention Ordinance
- Post-disaster Redevelopment/Recovery Ordinance
- Community Wildfire Protection Plan
- BCEGS Grade of 6 to 9

Yes=1 point No=0 points

- Capital Improvements Plan
- Economic Development Plan
- Historic Preservation Plan
- Transportation Plan
- Zoning Ordinance
- Subdivision Ordinance
- Site Plan Review Requirements
- Unified Development Ordinance
- Building Code
- Fire Code
- Participate in NFIP Program

II. Administrative and Technical Capability (Up to 18 points)

Yes=2 points No=0 points

- Planners with knowledge of land development and land management practices
- Engineers or professionals trained in construction practices related to buildings and/or infrastructure
- Planners or engineers with an understanding of natural and/or human-caused hazards
- Emergency manager
- Floodplain manager

Yes=1 point No=0 points

- Land surveyors
- Scientist familiar with the hazards of the community
- Staff with education or expertise to assess the community's vulnerability to hazards
- Personnel skilled in Geographic Information Systems (GIS) and/or HAZUS
- Resource development staff or grant writers
- Maintenance programs to reduce risk
- Warning systems/services
- Mutual Aid Agreements

III. Fiscal Capability (Up to 11 points)

Yes=1 point No=0 points

- Capital Improvement Programming
- Community Development Block Grants
- Special Purpose Taxes
- Gas / Electric Utility Fees
- Water / Sewer Fees
- Stormwater Utility Fees
- Development Impact Fees
- General Obligation Bonds
- Revenue Bonds
- Special Tax Bonds
- Other

IV. Education and Outreach Capability (Up to 7 points)

Yes=1 point No=0 points

- Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.
- Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)
- Natural disaster or safety related school programs
- StormReady certification
- Firewise Communities certification
- Public-private partnership initiatives addressing disaster-related issues
- Other

V. Self-Assessment of Overall Capability (Up to 12 points)

High=2 points Moderate=1 points Low=0 points (Self-ranked by jurisdiction)

- Technical Capability
- Fiscal Capability
- Administrative Capability
- Education and Outreach Capability
- Political Capability
- Overall Capability

Note: This methodology is based on best available information. If a jurisdiction did not provide information on one of the above items, a point value of zero (0) was assigned for that item.

Table 5.8 shows the results of the *Capability Assessment* using the designed scoring methodology. The capability score is based solely on the information provided by local officials in response to the *Local Capability Assessment Survey*. According to the assessment, the average local capability score for all responding jurisdictions is 59, which falls into the “High” capability ranking.

Table 5.8: Capability Assessment Results

Jurisdiction	Overall Capability Score	Overall Capability Rating
Alamance County	69	HIGH
Alamance	58	HIGH
Burlington	40	MODERATE
Elon	54	MODERATE
Graham	41	MODERATE
Green Level	62	HIGH
Haw River	66	HIGH
Mebane	60	HIGH
Ossipee	26	LIMITED
Swepsonville	57	HIGH
Orange County	58	HIGH
Carrboro	63	HIGH
Chapel Hill	77	HIGH
Hillsborough	66	HIGH
Durham County	80	HIGH
Durham	80	HIGH

Source: Local Capability Assessment Survey.

As previously discussed, one of the reasons for conducting a *Capability Assessment* is to examine local capabilities to detect any existing gaps or weaknesses within ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. These gaps or weaknesses have been identified, for each jurisdiction, in the tables found throughout this section. The participating jurisdictions used the *Capability Assessment* as part of the basis for the mitigation actions that are identified in Section 7; therefore, each jurisdiction addresses their ability to expand on and improve their existing capabilities through the identification of their mitigation actions.

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Section 6: Mitigation Strategy

The *Mitigation Strategy* section provides the blueprint for the participating jurisdictions in the Eno-Haw Region to follow to become less vulnerable to the negative effects of the natural hazards identified and addressed in this Plan. It is based on the general consensus of the Eno-Haw Hazard Mitigation Planning Team (HMPT) and the findings and conclusions of the *Risk Assessment* and *Capability Assessment*. It consists of the following five subsections:

- 6.1 Overview
- 6.2 Mitigation Goals
- 6.3 Identification and Analysis of Mitigation Techniques
- 6.4 Selection of Mitigation Techniques for the Eno-Haw Region
- 6.5 Plan Update Requirement

6.1 Overview

The intent of the *Mitigation Strategy* is to provide the Eno-Haw Region with overall goals that will serve as guiding principles for future mitigation policy and project administration, along with an analysis of mitigation techniques deemed available to meet those goals and reduce the impact of identified hazards. It is designed to be comprehensive, strategic, and functional in nature:

- In being comprehensive, the development of the *Mitigation Strategy* included a thorough review of all natural hazards and identifies extensive mitigation measures intended to not only reduce the future impacts of high risk hazards, but also to help the Eno-Haw Region achieve compatible economic, environmental, and social goals.
- In being strategic, the development of the *Mitigation Strategy* ensures that all policies and projects proposed for implementation are consistent with pre-identified, long-term planning goals.
- In being functional, each proposed mitigation action is linked to established priorities and assigned to specific departments or individuals responsible for their implementation with target completion deadlines. When necessary, funding sources are identified that can be used to assist in project implementation.

The first step in designing the *Mitigation Strategy* included the identification of mitigation goals. Mitigation goals represent broad statements that are achieved through the implementation of more specific mitigation actions. These actions include both hazard mitigation policies (such as the regulation of land in known hazard areas through a local ordinance), as well as hazard mitigation projects that seek to address specifically targeted hazard risks (such as the acquisition and relocation of a repetitive loss structure).

The second step involves the identification, consideration, and analysis of available mitigation measures to help achieve the identified mitigation goals. This is a long-term, continuous process sustained through the development and maintenance of this Plan. Alternative mitigation measures will continue to be considered as future mitigation opportunities are identified, as data and technology improve, as mitigation funding becomes available, and as the Plan is maintained over time.

The third and last step in designing the *Mitigation Strategy* is the selection and prioritization of specific mitigation actions for the Eno-Haw Region (found in Section 7: *Mitigation Action Plans*). Each County and participating jurisdiction has its own *Mitigation Action Plan* (MAP) that reflects the needs and concerns of that jurisdiction. The MAP represents an unambiguous and functional plan for action and is considered to be the most essential outcome of the mitigation planning process. A significant amount of time and effort was applied to this step in the process.

The MAP includes a prioritized listing of proposed hazard mitigation actions (policies and projects) for the Eno-Haw counties and incorporated municipalities to complete. Each action has accompanying information, such as the departments or individuals assigned responsibility for implementation, potential funding sources, and an estimated target date for completion. The MAP provides the departments or individuals responsible for implementing mitigation actions with a clear roadmap that also serves as an important tool for monitoring success or progress over time. The cohesive collection of actions listed in the MAP can also serve as an easily understood menu of mitigation policies and projects for those local decision makers who want to quickly review the recommendations and proposed actions of the Eno-Haw Regional Hazard Mitigation Plan.

In preparing each *Mitigation Action Plan* for the Eno-Haw Region, officials considered the overall hazard risk and capability to mitigate the effects of hazards as recorded through the risk and capability assessment process, in addition to meeting the adopted mitigation goals and unique needs of the planning area. Prioritization of the proposed mitigation actions was based on the factors outlined in subsection 6.1.1.

6.1.1 Mitigation Action Prioritization

The priority for each mitigation action was determined by the participating jurisdiction by identifying each action as high, moderate, or low priority. In order to make this decision, local government officials reviewed and considered the findings of the *Risk Assessment* and *Capability Assessment*. Other considerations included each individual mitigation action's effect on overall risk to life and property, its ease of implementation, its degree of political and community support, its general cost-effectiveness, and funding availability (if necessary).

6.2 Mitigation Goals

The primary goal of all local governments is to promote the public health, safety, and welfare of its citizens. In keeping with this standard, the Eno-Haw counties and participating municipalities have developed seven goal statements for local hazard mitigation planning in the Eno-Haw Region. In developing these goals, the previous three county hazard mitigation plans were reviewed to determine areas of consistency. The project consultant reviewed the wide range of strategies from each of the three previous county plans and a determination was made to review and discuss previous goals but to move forward with a newly crafted set of goals to better reflect the current needs and concerns of the Eno-Haw Region as a whole. These regional goals are presented in **Table 6.1**.

These regional goals were developed by the HMPT following the third planning team meeting. Each goal, purposefully broad in nature, serves to establish the parameters that were used to review and update existing mitigation actions and to aid in formulating new ones. The consistent implementation of mitigation actions over time will ensure that these mitigation goals are achieved.

Table 6.1: Regional Mitigation Goals

Goal #1	<i>Change, enhance, or adopt plans, ordinances, policies, regulations, and other local tools and mechanisms to better facilitate risk reduction activities and improve overall resiliency.</i>
Goal #2	<i>Enhance local political and financial support for risk reduction activities throughout the Eno-Haw Region.</i>
Goal #3	<i>Improve regular regional communication and foster the creation of more multi-jurisdictional regional planning efforts related to risk reduction and resiliency.</i>
Goal #4	<i>Implement structure and infrastructure projects to improve public safety, property protection, transportation, and other critical and essential functions of the Eno-Haw Region.</i>
Goal #5	<i>Improve operations for severe winter weather and other hazards and emergencies that cause similar disruptions to traffic, release times, power outages, sheltering, and communications.</i>
Goal #6	<i>Increase training, testing, and exercising opportunities related to the regional hazard mitigation plan.</i>
Goal #7	<i>Increase training, education, and awareness of community members related to natural hazards and their potential impacts within the Eno-Haw Region.</i>

6.3 Identification and Analysis of Mitigation Techniques

In formulating the *Mitigation Strategy* for the Eno-Haw Region, a wide range of activities were considered in order to help achieve the established mitigation goals, in addition to addressing any specific hazard concerns. These activities were discussed during the HMPT meetings. In general, all activities considered by the planning team can be classified under one of the following four broad categories of mitigation techniques: local plans and regulations, structure and infrastructure projects, natural systems protection, and education and awareness programs. These are described in detail below.

6.3.1 Local Plans and Regulations

Mitigation actions that fall under this category include government authorities, policies, or codes that influence the way land and buildings are developed and built. Examples of these types of actions include:

- Comprehensive plans
- Land use ordinances
- Subdivision regulations
- Development review
- NFIP Community Rating System
- Capital improvement programs
- Open space preservation
- Stormwater management regulations and master plans

6.3.2 Structure and Infrastructure Projects

Mitigation actions that fall under this category involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards. Many of these types of actions are projects eligible for funding through the FEMA Hazard Mitigation Assistance (HMA) program. Examples of these types of actions include:

- Acquisitions and elevations of structures in flood-prone areas
- Utility undergrounding
- Structural retrofits
- Floodwalls and retaining walls
- Detention and retention structures
- Culverts
- Safe rooms

6.3.3 Natural Systems Protection

Mitigation actions that fall under this category minimize damage and losses and also preserve or restore the functions of natural systems. Examples of these types of actions include:

- Sediment and erosion control
- Stream corridor restoration
- Forest management
- Conservation easements
- Wetland restoration and preservation

6.3.4 Education and Awareness Programs

Mitigation actions that fall under this category inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady or Firewise communities. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions. Examples of these types of actions include:

- Radio or television spots
- Websites with maps and information
- Real estate disclosure
- Presentations to school groups or neighborhood organizations
- Mailings to residents in hazard-prone areas
- StormReady
- Firewise

6.3.5 Other Types of Actions

Participating jurisdictions may wish to include other types of actions in their *Mitigation Action Plans* that do not fit into one of the categories listed above. In some cases, these may not be viewed as pure examples of mitigation, but they may be related in ways that make sense to the local government adopting the actions. Examples of these types of actions include:

- Warning systems
- Communications enhancements
- Emergency response training and exercises
- Evacuation management
- Sandbagging for flood protection
- Installing temporary shutters for immediate wind protection
- Other forms of emergency services

6.4 Selection of Mitigation Techniques for the Eno-Haw Region

To determine the most appropriate mitigation techniques for the jurisdictions in the Eno-Haw Region, the HMPT reviewed and considered the findings of the *Risk Assessment* and *Capability Assessment* to determine the best activities for their respective communities.

Other considerations included the effect of each mitigation action on overall risk to life and property, its ease of implementation, its degree of political and community support, its general cost-effectiveness, and funding availability (if necessary).

6.5 Plan Update Requirement

In keeping with FEMA requirements for plan updates, the mitigation actions identified in the previous Eno-Haw Region county plans were evaluated to determine their current implementation status. Updates on the implementation status of each existing mitigation action are provided as part of the *Mitigation Action Plans* found in Section 7.¹

¹ The 2010 hazard mitigation plan for Alamance County included one set of mitigation actions at the county level intended to apply to all jurisdictions countywide within the planning area. With the 2015 plan update and the understanding that each participating jurisdiction should have its own individual Mitigation Action Plan, those collective actions were assessed to determine which ones were appropriate for each jurisdiction. In the case of Alamance, Burlington, Elon, Graham, Green Level, Haw River, Mebane, Ossipee, and Swepsonville for example, not all actions “carry over” from the 2010 plan to the 2015 plan update because they were never directly relevant to the municipality. This is primarily true for “countywide” actions related to the Community Rating System (CRS), shelter agreements, and coordination with NCDOT. Ossipee is a clear example of this, as actions pertaining to the CRS for instance are not relevant because the community does not participate in the NFIP.

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Section 7: Mitigation Action Plans

The *Mitigation Action Plan* section includes a *Mitigation Action Plan* (MAP) for each participating jurisdiction. As stated in Section 6, each County and participating jurisdiction has its own MAP that reflects the needs and concerns of that jurisdiction. The MAP represents an unambiguous and functional plan for action and is considered to be the most essential outcome of the mitigation planning process.

The participating jurisdictions are listed below in the order that the MAPs are included in this section.

- **Alamance County**
- Village of Alamance
- City of Burlington
- Town of Elon
- City of Graham
- Town of Green Level
- Town of Haw River
- City of Mebane
- Town of Ossipee
- Town of Swepsonville

- **Orange County**
- Town of Carrboro
- Town of Chapel Hill
- Town of Hillsborough

- **Durham County**
- City of Durham

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Mitigation Action Plan—Alamance County

The Mitigation Action Plan for Alamance County is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for Alamance County.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Direct each County office or agency to assess how it can better incorporate hazard mitigation goals into its planning and implementation of its duties.
Goal: ¹	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County Emergency Management
Estimated Cost:	N/A
Potential Funding Sources:	County
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Countywide goals and implementation of the various duties will continue to be a vital part of our local governmental operations.

Mitigation Action 2	Encourage builders, developers, and architects to become familiar with the National Flood Insurance Program (NFIP) land use and building standards by attending annual workshops presented by the North Carolina Division of Emergency Management (NCEM). This can be accomplished by creating a mailing list and providing it to NCEM to use for its announcements. This task can be further supported by distributing copies of NCEM's announcements from the Alamance County Inspections Department when builders and developers apply for permits.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County Emergency Management
Estimated Cost:	Internal staff time
Potential Funding Sources:	General Fund
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County Emergency Management will attempt to implement, in conjunction with the Alamance County Inspections Department within fiscal year 2017, the distribution of information regarding the NFIP as it pertains to developers applying for permits within Alamance County.

¹ The previously adopted mitigation actions for Alamance County did not originally correlate with the new regional mitigation goals developed as part of the 2015 plan update because the 2015 goals did not exist at the time of the last plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan where applicable.

Mitigation Action 3		Encourage citizens and businesses/industries to develop emergency preparedness plans.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Alamance County Emergency Management; Alamance County LEPC	
Estimated Cost:	Internal staff time	
Potential Funding Sources:	LEPC	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	<p>The Local Emergency Planning Committee (LEPC) and Alamance County Emergency Management aggressively implement Emergency Action Plans (EAPs) as new and existing businesses operate in Alamance County. Current Business/Industry EAPs are reviewed at Tier II submittal. Citizen EAPs are provided by Alamance County EM via local community meetings, planned community outreach programs, and local civic organizations. This is an ongoing mitigation effort.</p>	

Mitigation Action 4		Encourage homeowners to review insurance policies as part of an overall family disaster plan.
Goal:	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Alamance County Emergency Management	
Estimated Cost:	Staff time	
Potential Funding Sources:	N/A	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	<p>Alamance County Emergency Management has been actively encouraging homeowners to review policies and will increase efforts to do so throughout 2015-2020.</p>	

Mitigation Action 5	Increase awareness of the natural hazards potential to local officials, the general public, and private industry.
Goal:	#7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County Emergency Management
Estimated Cost:	Staff time
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County Emergency Management is enhancing public awareness of natural hazards through continued use of advanced technology such as social media, Nixle, etc.

Mitigation Action 6	Maintain contact with the North Carolina Cooperative Extension Service through the local County agency regarding problems related to agriculture damage.
Goal:	#3
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood; Drought; Hail
Lead Agency/Department Responsible:	Alamance County Cooperative Extension Office
Estimated Cost:	Staff time
Potential Funding Sources:	General Fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County, through its employees, maintains contact with its citizens as well as the State concerning problems that are related to agricultural damages, such as by pestilence, storm damage, drought, etc.

Mitigation Action 7	Maintain hazard mitigation plan and floodplain information on the County website (www.alamance-nc.com).
Goal:	#6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County Emergency Management
Estimated Cost:	Staff time
Potential Funding Sources:	General Fund
Implementation Schedule:	December 2015
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County Emergency Management, working with all local and state resources, will review and update all hazard mitigation plans and floodplain information yearly beginning December 2015. All agencies will be invited to attend—the lead coordinator for these meetings will be the Alamance County Emergency Management Planner.

Mitigation Action 8	Maintain shelter agreements with the American Red Cross.
Goal:	#1; #5
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County Emergency Management
Estimated Cost:	Staff time
Potential Funding Sources:	County as well as potential federal and state sources
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	American Red Cross maintains shelter agreements with facilities for local emergency shelters per their guidelines. These agreements are reviewed annually by American Red Cross.

Mitigation Action 9	Review methods of school construction to ensure that all new schools are constructed to the maximum cost feasible standards of wind resistance, flood resistance, and access so that they can be used as shelters for evacuees during and after natural hazard events.
Goal:	#4
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County Inspections Department
Estimated Cost:	Staff time
Potential Funding Sources:	General Fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County will continue to enforce all applicable codes and standards as they apply to new and existing buildings and structures as it pertains to use as shelters.

Mitigation Action 10	Review the subdivision regulations and make appropriate changes to encourage alternatives to placing lots in flood-prone areas and to minimize impervious surface coverings, if necessary.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County Planning Department
Estimated Cost:	Staff time
Potential Funding Sources:	General Fund
Implementation Schedule:	2015-2020 (meetings are held on an “as-needed” basis)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County pursues an active role in Technical Review Committee (TRC) meetings for new subdivisions that are proposed to be built for flood-prone situations.

Mitigation Action 11	Discourage the public and developers from developing property in flood zones.
Goal:	#1; #6
Category:	Local Plans and Regulations; Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	General Fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	By working with developers and property owners, Alamance County hopes to dramatically decrease the potential for property being developed that would contribute to vast flooding situations thereby decreasing dollar loss to stakeholders.

Mitigation Action 12	Look for opportunities to acquire or relocate structures vulnerable to floods.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County Emergency Management; Alamance County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	No attempt at this time
Priority (High, Moderate, Low):	Low
2015 Status:	Deleted
Narrative Explanation:	Alamance County has discontinued the implementation of looking for opportunities to relocate structures that are vulnerable to floods due to lack of trained personnel to conduct this.

Mitigation Action 13	Monitor structures affected by flood and track damages and repair costs. If damages and repair costs are high relative to the value of the structure, consider mitigation including elevation, acquisition, or floodproofing.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County Emergency Management; Alamance County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	General Fund
Implementation Schedule:	When flooding event takes place
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County has the capability to conduct damage assessment reports with assistance from the State if necessary. Damage assessment teams consisting of County Tax Appraisers, County Building Inspectors, and local ARES group have received training in conducting, evaluating, and assessing damages. Tracking of these damages and related expenses are maintained via the Alamance County Emergency Management office.

Mitigation Action 14	Propose a policy to the Board of Commissioners prohibiting the development of critical public facilities in the 100-year floodplain in cases where viable alternatives exist. Presently, most critical facilities located in the floodplain are waste pump stations because they must be located at low elevations because they handle gravity flowing sewage.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County Planning Department
Estimated Cost:	Unknown
Potential Funding Sources:	General Fund or possible grants
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County has typically experienced significant or drastic flooding during either prolonged weather events or sudden downbursts (summer storms) but these are usually few and far between. Therefore no action has been taken up to this point; however, a new effort to propose this policy will be conducted by July 2017.

Mitigation Action 15	Continue to expand the County's Geographic Information System (GIS) capabilities to include maintaining Elevation Certificates in a computer database.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County GIS Department
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The county's GIS department maintains an active role in database capabilities for Elevation Certificates.

Mitigation Action 16	Continue Alamance County's participation in the National Flood Insurance Program (NFIP) so citizens are eligible for flood insurance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	General Fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	By participating in the NFIP, the goal is for more homeowners /stakeholders to have adequate coverage for flood losses.

Mitigation Action 17		Join the National Flood Insurance Program (NFIP).
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	Flood	
Lead Agency/Department Responsible:	Alamance County Planning Department	
Estimated Cost:	Staff time	
Potential Funding Sources:	N/A	
Implementation Schedule:	December 2015	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	All county municipalities with the exception of Ossipee participate in the NFIP. Educational information will be shared with Ossipee regarding NFIP with completion December 2015.	

Mitigation Action 18		Consider joining the NFIP's Community Rating System (CRS).
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	Flood	
Lead Agency/Department Responsible:	Alamance County Planning Department	
Estimated Cost:	N/A	
Potential Funding Sources:	N/A	
Implementation Schedule:	July 2018	
Priority (High, Moderate, Low):	Low	
2015 Status:	Deferred	
Narrative Explanation:	Alamance County is not actively pursuing joining the NFIP'S Community Rating System at this time due to the lack of available personnel during the 2010-2015 plan. With additional personnel this will be completed by July 2018.	

Mitigation Action 19	Develop specific regulations that prohibit dumping in the county's watersheds.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County will continue to monitor and actively implement by regulation/law concerning illegal dumping into any of the waterways that affect the county.

Mitigation Action 20	Maintain documents about flood insurance, flood protection, floodplain management, and natural and beneficial functions of floodplains at the local libraries and government offices.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	June 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Deferred
Narrative Explanation:	Alamance County in conjunction with local emergency management offices will attempt to educate the public within the next 24 months within local libraries, etc. A projected date of completion for this education is June 2017. This action was deferred due to a lack of appropriate staff to implement this action between 2010 and 2015 but will be a higher priority for this version of the plan.

Mitigation Action 21	Maintain GIS system at www.alamance-nc.com. From this site anyone from a private citizen, builder, insurance company, etc. can see if a property is located in the 1-percent-annual-chance (100-year) floodplain.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County GIS Department
Estimated Cost:	N/A
Potential Funding Sources:	General Fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County will continue to provide this service to its taxpayers.

Mitigation Action 22	Monitor recreational facilities located in the floodplain and evaluate flood resistance of county structures.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	General Fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County will continue to monitor its infrastructure for potential flooding problems and implement policies and/or procedures as situations dictate.

Mitigation Action 23	Monitor reservoirs for potential flooding problems and note any unexpected flooding issues.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County Emergency Management
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	All reservoirs and water sources located throughout the county have been processed by various companies (i.e., dam review, etc.); and will be assessed on an annual basis (2015, 2016, 2017, 2018, and 2019).
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County reservoirs are assessed each year for potential problems as well as security issues.

Mitigation Action 24	Provide local real estate agents with handouts that will advise potential buyers to investigate the flood hazard for the property they are considering purchasing.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County Planning Department
Estimated Cost:	Unknown
Potential Funding Sources:	Unknown
Implementation Schedule:	July 2019
Priority (High, Moderate, Low):	Low
2015 Status:	Deferred
Narrative Explanation:	Alamance County will implement this type of education by July 2019 for residents of the county.

Mitigation Action 25	Educate citizens to listen for the watches and warnings issued by the National Weather Service.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County Emergency Management
Estimated Cost:	N/A
Potential Funding Sources:	County
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County Emergency Management will take the lead on public education through seminars by our local LEPC, media, local P.S. meetings with various business organizations, etc. on National Weather Service events.

Mitigation Action 26	Maintain Alamance County Communications' capability to monitor weather conditions and advise all emergency services regarding watches and warnings.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County Emergency Management
Estimated Cost:	\$19,000
Potential Funding Sources:	Alamance County
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County has implemented NIXLE notification in early 2015 for monitoring weather conditions, etc. for residents of the county as well as county employees, schools, hospital, etc. Continuous updating of citizen information into NIXLE continues. Alamance County is currently preparing to be NWS Storm Ready. Training of Communications' staff and purchasing of weather monitoring capabilities for Communication centers is underway with completion by December 2015—as per NWS, maintaining Storm Ready status will be an ongoing process.

Mitigation Action 27	Put a weather alert radio in the County School Administration office, County Managers office, Central Communications (CCOMM), and Emergency Operations Center (EOC).
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County Emergency Management
Estimated Cost:	Unknown
Potential Funding Sources:	LEPC and local business partners
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	Alamance County completed the installation of weather alert devices in the school administration office, County Manager's office, CCOM, and EOC in May 2015. The County's Emergency Alert system (NIXLE) implemented in February 2015 is also utilized as a weather notification system.

Mitigation Action 28	Review all fire districts coverage to ensure that there are adequate quantities of water for firefighting purposes and that all water points are maintained on a regular basis.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Fire/Wildfire
Lead Agency/Department Responsible:	Alamance County Fire Marshal's Office
Estimated Cost:	Staff time
Potential Funding Sources:	County
Implementation Schedule:	Based on Rating Schedule dictated by Office of State Fire Marshal (OSFM)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	All fire departments in Alamance County passed their ISO rating(s) between 2010 and 2015 in which all water points as well as fire districts were reviewed. However, the NC Office of the State Fire Marshal (OSFM) continues to selectively evaluate all Alamance County Fire Departments.

Mitigation Action 29	Meet annually with State Forester for Alamance County to improve coordination of wildfire control and response.
Goal:	#3
Category:	Education and Awareness Programs; Natural Systems Protection
Hazard(s) Addressed:	Wildfire
Lead Agency/Department Responsible:	Alamance County Fire Marshal's Office (FMO)
Estimated Cost:	Staff time
Potential Funding Sources:	N/A
Implementation Schedule:	Annually (2015, 2016, 2017, 2018, 2019)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County FMO along with local fire departments will meet with the local ranger to discuss the upcoming year. A lot of wildfire control and response will be determined by the type of year we are having (i.e., hot, dry, windy conditions, drought, etc.). Alamance County's local Forestry Service participates in the Alamance County Fire Investigation Task Force.

Mitigation Action 30	Coordinate with the North Carolina Department of Transportation (NCDOT) to maintain adequate and effective snow and ice removal plans by the towns/cities and NCDOT. "Adequate" means that all major thoroughfares are cleared and remain clear within 12 hours of last snowfall.
Goal:	#1; #3
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Winter Weather
Lead Agency/Department Responsible:	Alamance County Emergency Management
Estimated Cost:	Staff time
Potential Funding Sources:	Budgeting by various municipalities throughout the county
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County participates in quarterly meetings with local NCDOT officials in preparation of hazardous weather conditions.

Mitigation Action 31		Develop a detailed hazard assessment for dams in Alamance County and add to county hazard mitigation plan.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	Dam Failure	
Lead Agency/Department Responsible:	Alamance County Emergency Management	
Estimated Cost:	N/A	
Potential Funding Sources:	City of Burlington; Alamance County	
Implementation Schedule:	Completed	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Completed	
Narrative Explanation:	A new dam failure analysis was conducted in conjunction with the State for Alamance, Orange, and Durham counties as part of the 2015 hazard mitigation plan update. Also, Alamance County has abundant water supplies and therefore has dam IAP's in place for each major water thoroughfare with early notification in place for each section of the county that could be potentially affected by a breach and also notification for our neighboring counties adjacent to Alamance.	

Mitigation Action 32		When the county land use plan is complete, create a land use map with an overlay of flood hazards and any other natural hazards that can be mapped.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Alamance County Emergency Management; Alamance County GIS Department	
Estimated Cost:	Unknown at this time	
Potential Funding Sources:	County	
Implementation Schedule:	By mid-2016	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In-Progress	
Narrative Explanation:	Alamance County has completed land use maps of flood hazards that affect rivers, local lakes, and some low lying areas that have been identified. Countywide goal to be completed with all known areas by mid-2016.	

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for Alamance County for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Seek funding for the retrofit of critical facilities and County-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
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Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	County Buildings and Inspections Department; County Planning Department; County Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding for the installation of backup generators or quick connect hook ups for mobile generators on any newly constructed and existing county critical facilities.
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Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	County Buildings and Inspections Department; County Planning Department; County Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—Village of Alamance

The Mitigation Action Plan for the Village of Alamance is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the Village of Alamance.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	
Encourage homeowners to review insurance policies as part of an overall family disaster plan.	
Goal: ¹	#7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Village of Alamance
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Village of Alamance encourages homeowners to continually review/update homeowner's policies.

Mitigation Action 2	
Increase awareness of the natural hazards potential to local officials, the general public, and private industry.	
Goal:	#7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Village of Alamance
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Village of Alamance participates in conjunction with the County, LEPC, media, etc. in making the general public and businesses aware of potential hazards.

¹ The previously adopted mitigation actions for the Village of Alamance did not originally correlate with the new regional mitigation goals developed as part of the 2015 plan update because the 2015 goals did not exist at the time of the last plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan where applicable.

Mitigation Action 3	Maintain hazard mitigation plan and floodplain information on the Town's website.
Goal:	#6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Village of Alamance
Estimated Cost:	None
Potential Funding Sources:	N/A
Implementation Schedule:	By December 2015
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Village of Alamance will add a link on its home page to the Hazard Mitigation Plan on the County website. Projected completion date of December 2015.

Mitigation Action 4	Continue to expand the County's Geographic Information System (GIS) capabilities to include maintaining Elevation Certificates in a computer database.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Village of Alamance
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Village of Alamance will continue to work with Alamance County GIS Department on implementation of data.

Mitigation Action 5	Continue the Village of Alamance's participation in the National Flood Insurance Program (NFIP) so citizens are eligible for flood insurance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Village of Alamance
Estimated cost	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Village of Alamance will continue to participate in the NFIP.

Mitigation Action 6	Provide GIS-based information so that anyone from a private citizen, builder, insurance company, etc. can see if a property is located in the 1-percent-annual-chance (100-year) floodplain.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Village of Alamance
Estimated Cost:	None
Potential Funding Sources:	N/A
Implementation Schedule:	By July 2016
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	A link on the Village's website to the County's GIS will be added. Projected completion date of June 2016.

Mitigation Action 7	Monitor reservoirs, lakes, and streams for potential flooding problems and note any unexpected flooding issues.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Village of Alamance
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	Current date range of 2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Village as well as the County will continue to monitor any potential flood risks within the Village district.

Mitigation Action 8	Educate citizens to listen for the watches and warnings issued by the National Weather Service.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Village of Alamance
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	By July 2016
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Village is working in conjunction with Alamance County on its alert system NIXLE to enroll citizens in this notification system as well as work with local media, etc. Projected completion date of 06/2016.

Mitigation Action 9	Review all fire districts coverage to ensure that there are adequate quantities of water for firefighting purposes and that all water points are maintained on a regular basis.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Fire/Wildfire
Lead Agency/Department Responsible:	Village of Alamance
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	Based on Rating Schedule dictated by Office of State Fire Marshal (OSFM)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County will continue to coordinate this with the Village of Alamance's FD. (EM Holt FD).

Mitigation Action 10	Meet annually with State Forester for Alamance County to improve coordination of wildfire control and response.
Goal:	#3
Category:	Education and Awareness Programs; Natural Systems Protection
Hazard(s) Addressed:	Wildfire
Lead Agency/Department Responsible:	Village of Alamance
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	Yearly (2015, 2016, 2017, 2018, 2019)
Priority (High, Moderate, Low):	Moderate
2015 Status:	In Progress
Narrative Explanation:	Alamance County will continue to coordinate this with the Village of Alamance's FD. (EM Holt FD)

Mitigation Action 11	When the county land use plan is complete, create a land use map with an overlay of flood hazards and any other natural hazards that can be mapped.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Village of Alamance
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Continue to help provide data for Alamance County GIS system.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the Village of Alamance for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Seek funding for the retrofit of critical facilities and Village-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
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Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Village of Alamance
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding for the installation of backup generators or quick connect hook ups for mobile generators on any newly constructed and existing village critical facilities.
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Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Village of Alamance
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—City of Burlington

The Mitigation Action Plan for the City of Burlington is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the City of Burlington.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Encourage builders, developers, and architects to become familiar with the National Flood Insurance Program (NFIP) land use and building standards by attending annual workshops presented by the North Carolina Division of Emergency Management (NCEM).
Goal: ¹	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Burlington Building and Inspections; City of Burlington Office of Emergency Management
Estimated Cost:	Internal staff time
Potential Funding Sources:	General fund
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Burlington Planning Department and City of Burlington Office of Emergency Management take an active role promulgating information about the NFIP to the building and construction industry.

Mitigation Action 2	Encourage citizens and businesses/industries to develop emergency preparedness plans.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Burlington Office of Emergency Management; Alamance County LEPC
Estimated Cost:	Internal staff time
Potential Funding Sources:	LEPC
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	The City of Burlington Emergency Management and Local Emergency Planning Committee (LEPC) aggressively implement Emergency Action Plans (EAPs) as new and existing businesses operate in Burlington.

¹ The previously adopted mitigation actions for the City of Burlington did not originally correlate with the new regional mitigation goals developed as part of the 2015 plan update because the 2015 goals did not exist at the time of the last plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan where applicable.

Mitigation Action 3		Encourage homeowners to review insurance policies as part of an overall family disaster plan.
Goal:	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	City of Burlington Office of Emergency Management	
Estimated Cost:	Staff time	
Potential Funding Sources:	N/A	
Implementation Schedule:	June 2016	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	<p>The City of Burlington Office of Emergency Management seeks every opportunity to engage the public concerning planning and preparation for any disaster. In combination with presentations tailored for each learning opportunity, literature, both general and focused on the needs of the group, is distributed.</p>	

Mitigation Action 4		Increase awareness of the natural hazards potential to local officials, the general public, and private industry.
Goal:	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	City of Burlington Office of Emergency Management; Burlington Office of Public Information	
Estimated Cost:	Staff time	
Potential Funding Sources:	N/A	
Implementation Schedule:	June 2017	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	<p>The City of Burlington Office of Emergency Management, in conjunction with Burlington's Public Information Officer, is enhancing public awareness of natural hazards through public presentations to various groups and organizations and at public events such as the annual Carousel Festival or special events.</p>	

Mitigation Action 5	Review methods of school construction to ensure that all new schools are constructed to the maximum cost feasible standards of wind resistance, flood resistance, and access so that they can be used as shelters for evacuees during and after natural hazard events.
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Goal:	#4
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Burlington Planning Department; City of Burlington Building and Inspections Department
Estimated Cost:	Staff time
Potential Funding Sources:	General Fund
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	City of Burlington will continue to enforce all applicable codes and standards as they apply to new and existing buildings and structures as it pertains to use as shelters.

Mitigation Action 6	Review the subdivision regulations and make appropriate changes to encourage alternatives to placing lots in flood-prone areas and to minimize impervious surface coverings, if necessary.
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Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Burlington Planning Department
Estimated Cost:	Staff time
Potential Funding Sources:	General Fund
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	City of Burlington is deeply involved in Technical Review Committee (TRC) meetings for new subdivisions that are proposed to be built for flood-prone situations and offering a variety of alternatives hinged on mitigation of flood loss.

Mitigation Action 7	Discourage the public and developers from developing property in flood zones.
Goal:	#1; #6
Category:	Local Plans and Regulations; Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Burlington Building and Inspections Division
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	By working with developers and property owners, the City of Burlington will decrease the potential for property being developed that would contribute to vast flooding situations thereby decreasing dollar loss to stakeholders.

Mitigation Action 8	Monitor structures affected by flood and track damages and repair costs. If damages and repair costs are high relative to the value of the structure, consider mitigation including elevation, acquisition, or floodproofing.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Burlington Emergency Management; City Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	When flooding event takes place
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Burlington has the capability to conduct damage assessment reports with assistance from the County and subsequently the State if necessary.

Mitigation Action 9		Adopt policy prohibiting the development of critical public facilities in the 100-year floodplain in cases where viable alternatives exist.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	Flood	
Lead Agency/Department Responsible:	City of Burlington Building and Inspections Division	
Estimated Cost:	Unknown	
Potential Funding Sources:	General fund or possible grants	
Implementation Schedule:	June 2017	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	<p>The City of Burlington Floodplain Manager oversees any construction of acquisition of property in flood-prone areas. It is not the policy of the City to place critical systems in areas subject to flooding.</p>	

Mitigation Action 10		Expand the City's Geographic Information System (GIS) capabilities to include more hazard specific information.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	Flood	
Lead Agency/Department Responsible:	City of Burlington GIS Division	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff time	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	<p>The City of Burlington's GIS department maintains an active database containing information on a variety of different hazards. Capability includes the ability to define hazard areas from historical data as well as the ability to project potential areas of concern. The City will also continue to monitor opportunities to enhance GIS technologies and appropriate datasets for hazard mitigation planning.</p>	

Mitigation Action 11	Continue the City's participation in the National Flood Insurance Program (NFIP) so citizens are eligible for flood insurance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Burlington Buildings and Inspections Division
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	By participating in the NFIP, the goal is for more homeowners /stakeholders to have adequate coverage for flood losses.

Mitigation Action 12	Consider joining the NFIP's Community Rating System (CRS).
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Burlington Inspections Department
Estimated Cost:	Personnel costs
Potential Funding Sources:	General fund
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Low
2015 Status:	Completed
Narrative Explanation:	The City of Burlington is now an active participant in the NFIP'S Community Rating System.

Mitigation Action 13	Develop specific regulations that prohibit dumping in the City's watersheds.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Burlington Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	City of Burlington will continue to monitor and actively implement by regulation/law concerning illegal dumping into any of the waterways that affect the county.

Mitigation Action 14	Maintain documents about flood insurance, flood protection, floodplain management, and natural and beneficial functions of floodplains at the local libraries and government offices.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Burlington; Alamance County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	June 2017
Priority (High, Moderate, Low):	Low
2015 Status:	Deferred
Narrative Explanation:	City of Burlington will attempt to educate the public by June 2017 within local libraries, etc.

Mitigation Action 15	Monitor recreational facilities located in the floodplain and evaluate flood resistance of city structures.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Burlington; City of Burlington Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	City of Burlington will continue to monitor its infrastructure for potential flooding problems and implement policies and/or procedures as situations dictate.

Mitigation Action 16	Monitor reservoirs, lakes, and streams for potential flooding problems and note any unexpected flooding issues.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Burlington
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	All reservoirs and water sources located throughout the city have been processed by various companies (i.e. dam review, etc.). City of Burlington reservoirs are assessed each year for potential problems as well as security issues.

Mitigation Action 17	Provide local real estate agents with handouts that will advise potential buyers to investigate the flood hazard for the property they are considering purchasing.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Burlington; City of Burlington Planning Department
Estimated Cost:	Unknown
Potential Funding Sources:	Unknown
Implementation Schedule:	By December 2017
Priority (High, Moderate, Low):	Low
2015 Status:	Deferred
Narrative Explanation:	The City will implement this type of program by December 2017 for residents of Burlington.

Mitigation Action 18		Educate citizens to listen for the watches and warnings issued by the National Weather Service (NWS).
Goal:	#6	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	City of Burlington Office of Emergency Management	
Estimated Cost:	N/A	
Potential Funding Sources:	County	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The City of Burlington Office of Emergency Management conducts annual presentations to Burlington Housing authority, Burlington Senior center, and Burlington Community network and maintains a presence at local community events such as the annual Carousel Festival. Presentations include NWS information as well as inclement and hazardous weather planning/preparation.	

Mitigation Action 19		Put a weather alert radio in the City Manager's office, Burlington 911 Center, and Emergency Operations Center (EOC).
Goal:	#6	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	City of Burlington Office of Emergency Management	
Estimated Cost:	Unknown	
Potential Funding Sources:	LEPC and local business partners	
Implementation Schedule:	Completed	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Completed	
Narrative Explanation:	The City of Burlington Office of Emergency Management completed the installation of weather alert devices in the City Manager's office, Burlington 911 center, and EOC. The County's Emergency Alert system (NIXLE), implemented in February 2015, is also utilized as a weather notification system by city personnel.	

Mitigation Action 20	Review all fire districts coverage to ensure that there are adequate quantities of water for firefighting purposes and that all water points are maintained on a regular basis.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Fire/Wildfire
Lead Agency/Department Responsible:	City of Burlington Fire Department; City of Burlington Water Department
Estimated Cost:	Staff time
Potential Funding Sources:	County
Implementation Schedule:	Based on Rating Schedule dictated by Office of State Fire Marshal (OSFM)Ongoing implementation
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Burlington Fire Department and Burlington Water Department have regular maintenance schedules for water supply points.

Mitigation Action 21	Meet annually with State Forester for Alamance County to improve coordination of wildfire control and response.
Goal:	#3
Category:	Education and Awareness Programs; Natural Systems Protection
Hazard(s) Addressed:	Wildfire
Lead Agency/Department Responsible:	City of Burlington Fire Department
Estimated Cost:	Staff time
Potential Funding Sources:	N/A
Implementation Schedule:	Annually (2015, 2016, 2017, 2018, 2019)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed/To Be Continued
Narrative Explanation:	The Burlington Fire Department works with state officials and surrounding jurisdictions to plan appropriate responses to fires.

Mitigation Action 22	Coordinate with the North Carolina Department of Transportation (NCDOT) to maintain adequate and effective snow and ice removal plans by the towns/cities and NCDOT. "Adequate" means that all major thoroughfares are cleared and remain clear within 12 hours of last snowfall.
Goal:	#1; #3
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Winter Weather
Lead Agency/Department Responsible:	City of Burlington Office of Emergency Management
Estimated Cost:	Staff time
Potential Funding Sources:	Budgeting by various municipalities throughout the county
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	The City of Burlington actively works with NCDOT to facilitate snow removal as proscribed.

Mitigation Action 23	Develop a detailed hazard assessment for dams in Alamance County and add to county hazard mitigation plan.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Dam Failure
Lead Agency/Department Responsible:	City of Burlington Office of Emergency Management
Estimated Cost:	N/A
Potential Funding Sources:	City of Burlington; Alamance County
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed/To Be Continued
Narrative Explanation:	The City of Burlington has Emergency Action Plans (EAPs) for situations arising from the compromise of dams owned by the City.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the City of Burlington for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Request that each City department/office assess how it can better incorporate hazard mitigation goals into its separate planning processes and/or implementation of its duties.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Burlington Office of Emergency Management
Estimated Cost:	N/A
Potential Funding Sources:	City Funds
Implementation Schedule:	June 2017
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding to retrofit critical facilities and City-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, 320 or 361 compliant safe rooms, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Burlington Buildings and Inspections Division; City of Burlington Planning Department; City of Burlington Office of Emergency Management
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 3	Seek funding to install backup generators or quick connect hook ups for mobile generators on any newly constructed, City-owned critical facilities.
Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Burlington Buildings and Inspections Division; City of Burlington Planning Department; City of Burlington Office of Emergency Management
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—Town of Elon

The Mitigation Action Plan for the Town of Elon is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the Town of Elon.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Encourage builders, developers, and architects to become familiar with the National Flood Insurance Program (NFIP) land use and building standards by attending annual workshops presented by the North Carolina Division of Emergency Management (NCEM). This can be accomplished by creating a mailing list and providing it to NCEM to use for its announcements. This task can be further supported by distributing copies of NCEM's announcements from the Alamance County Inspections Department when builders and developers apply for permits.
Goal: ¹	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Elon
Estimated Cost:	Unknown
Potential Funding Sources:	General staff time
Implementation Schedule:	Projected completion date of July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Both Alamance County and the Town of Elon can provide this information during the Town's Technical Review Committee (TRC) process. The Town of Elon can directly provide this information to the institutions with the most development activity, such as Elon University, Twin Lakes, and Blakey Hall. A link to the Flood Damage Prevention Ordinance has been placed on the Town's website.

Mitigation Action 2	Encourage citizens and businesses/industries to develop emergency preparedness plans.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Elon
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town will coordinate efforts to meet with major institutions and businesses (Elon University, Twin Lakes, Blakey Hall, Labcorp, Carolina Biological, Sonoco, and Engineering Systems) to encourage developing these plans.

¹ The previously adopted mitigation actions for the Town of Elon did not originally correlate with the new regional mitigation goals developed as part of the 2015 plan update because the 2015 goals did not exist at the time of the last plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan where applicable.

Mitigation Action 3		Encourage homeowners to review insurance policies as part of an overall family disaster plan.
Goal:	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Town of Elon	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff time	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The Town of Elon is currently working on an Emergency Preparedness page on the Town website. This information will be added to this new page to help inform town residents.	

Mitigation Action 4		Increase awareness of the natural hazards potential to local officials, the general public, and private industry.
Goal:	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Town of Elon	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff time	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	This will be incorporated into the Town's new Emergency Preparedness page on the Town website and a link will be added to the Alamance County Emergency Preparedness webpage.	

Mitigation Action 5		Maintain hazard mitigation plan and floodplain information on the Town's website (www.elonnc.com).
Goal:	#6; #7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Town of Elon	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff time	
Implementation Schedule:	Projected completion date of July 2016	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The Town of Elon will install a link on its new Emergency Preparedness webpage to the Hazard Mitigation Plan, NFIP website, and the Flood Damage Prevention Ordinance (already in the Planning Department's documents for download).	

Mitigation Action 6		Maintain shelter agreements with the American Red Cross.
Goal:	#1; #5	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Alamance County; Town of Elon	
Estimated Cost:	N/A	
Potential Funding Sources:	General fund	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	American Red Cross maintains agreements with Shelter facilities in Alamance County. Those agreements are reviewed by American Red Cross on an annual basis.	

Mitigation Action 7	Review methods of school construction to ensure that all new schools are constructed to the maximum cost feasible standards of wind resistance, flood resistance, and access so that they can be used as shelters for evacuees during and after natural hazard events.
Goal:	#4
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County; Town of Elon
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Alamance County Inspections Department performs this action for the Town of Elon. No new schools were built in the past five years (2010-2015). No new schools are scheduled for completion within the next five years (2015-2020).

Mitigation Action 8	Review the subdivision regulations and make appropriate changes to encourage alternatives to placing lots in flood-prone areas and to minimize impervious surface coverings, if necessary.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Elon
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	The Town of Elon has adopted the Flood Damage Prevention Ordinance, Phase II NPDES Storm water Regulations, and the Jordan Lake Riparian Buffer Ordinance.

Mitigation Action 9	Discourage the public and developers from developing property in flood zones.
Goal:	#1; #6
Category:	Local Plans and Regulations; Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Elon
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	Already implemented through the Town's TRC review process and building permits.

Mitigation Action 10	Consider adopting a policy prohibiting the development of critical public facilities in the 100-year floodplain in cases where viable alternatives exist. Presently, most critical facilities located in the floodplain are waste pump stations because they must be located at low elevations because they handle gravity flowing sewage.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Elon Public Works Department; Town of Elon Planning Department
Estimated Cost:	Unknown
Potential Funding Sources:	General fund
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The two departments need to coordinate an inventory for all public facilities and identify which facilities are within the 100-year floodplain.

Mitigation Action 11	Expand the County's Geographic Information System (GIS) capabilities to include maintaining Elevation Certificates in a computer database.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County; Town of Elon
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	By July 2016
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Elon will continue to work with the Alamance County GIS Department to implement this.

Mitigation Action 12	Continue Town of Elon's participation in the National Flood Insurance Program (NFIP) so citizens are eligible for flood insurance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Elon
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town currently participates in the NFIP.

Mitigation Action 13	Develop specific regulations that prohibit dumping in the county's watersheds.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County; Town of Elon
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	This is covered under the Town of Elon's illicit discharge ordinance as well. This can be found in the Phase II NPDES Storm water regulations.

Mitigation Action 14	Maintain documents about flood insurance, flood protection, floodplain management, and natural and beneficial functions of floodplains at the local libraries and government offices.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Elon; Alamance County
Estimated Cost:	N/A
Potential Funding Sources:	General fund balance
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Elon is the FEMA repository for all related documents within its jurisdiction. Also, the Town works closely with Alamance County concerning flooding issues.

Mitigation Action 15	Maintain GIS system at www.alamance-nc.com. From this site anyone from a private citizen, builder, insurance company, etc. can see if a property is located in the 1-percent-annual-chance (100-year) floodplain.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	By June 2016
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Will provide a link on the Town's website to the County's GIS. Projected date of completion of June 2016.

Mitigation Action 16	Monitor recreational facilities located in the floodplain and evaluate flood resistance of town structures.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Elon Public Works Department
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Elon Public Works Department will continue to monitor this.

Mitigation Action 17	Monitor reservoirs, lakes, and streams for potential flooding problems and note any unexpected flooding issues.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Elon; Alamance County
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Both the Town and the County will continue to monitor any potential flood risks within the area.

Mitigation Action 18	Provide local real estate agents with handouts that will advise potential buyers to investigate the flood hazard for the property they are considering purchasing.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Elon
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	By July 2016
Priority (High, Moderate, Low):	Low
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town will provide links to the county GIS and NC FRIS website.

Mitigation Action 19	Educate citizens to listen for the watches and warnings issued by the National Weather Service.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Elon
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	By December 2016
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town will contact Alamance County about its countywide emergency alert system, Nixle, and how to participate so that Town residents will use as well. This would include adding a link to it on the Town's website. Training will be held in 2015.

Mitigation Action 20	Review all fire districts coverage to ensure that there are adequate quantities of water for firefighting purposes and that all water points are maintained on a regular basis.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Fire/Wildfire
Lead Agency/Department Responsible:	Alamance County; Town of Elon Fire Department
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	Based on Rating Schedule dictated by Office of State Fire Marshal (OSFM)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County will continue to coordinate with the Town of Elon Fire Department on this action.

Mitigation Action 21	Meet annually with State Forester for Alamance County to improve coordination of wildfire control and response.
Goal:	#3
Category:	Education and Awareness Programs; Natural Systems Protection
Hazard(s) Addressed:	Wildfire
Lead Agency/Department Responsible:	Alamance County; Town of Elon Fire Department
Estimated Cost:	N/A
Potential Funding Sources:	None
Implementation Schedule:	Yearly (2015, 2016, 2017, 2018, 2019,)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County will continue to coordinate with the Town of Elon Fire Department on this action.

Mitigation Action 22	Coordinate with the North Carolina Department of Transportation (NCDOT) to maintain adequate and effective snow and ice removal plans by the towns/cities and NCDOT. "Adequate" means that all major thoroughfares are cleared and remain clear within 12 hours of last snowfall.
Goal:	#1; #3
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Winter Weather
Lead Agency/Department Responsible:	Town of Elon
Estimated Cost:	Unknown
Potential Funding Sources:	General fund
Implementation Schedule:	As winter weather impacts the area
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town's Public Works Department will continue to work with NCDOT on this action.

Mitigation Action 23	When the county land use plan is complete, create a land use map with an overlay of flood hazards and any other natural hazards that can be mapped.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Elon
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Will provide data for Alamance County GIS system.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the Town of Elon for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Purchase a generator for Town Hall.
Goal:	#5
Category:	Equipment
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Elon
Estimated Cost:	\$50,000
Potential Funding Sources:	Actively seeking grants and saving money for the same.
Implementation Schedule:	2017- 2020
Priority (High, Moderate, Low):	High

Mitigation Action 2	Seek funding to retrofit critical facilities and Town-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, 320 or 361 compliant safe rooms, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town Buildings and Inspections Department; Town Planning Department; Town Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—City of Graham

The Mitigation Action Plan for the City of Graham is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the City of Graham.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Encourage builders, developers, and architects to become familiar with the National Flood Insurance Program (NFIP) land use and building standards by attending annual workshops presented by the North Carolina Division of Emergency Management (NCEM). This can be accomplished by creating a mailing list and providing it to NCEM to use for its announcements. This task can be further supported by distributing copies of NCEM's announcements from the Alamance County Inspections Department when builders and developers apply for permits.
Goal: ¹	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Graham
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Both Alamance County and the City of Graham work together to ensure that developers are up-to-date when applying for permits and by attending workshops.

Mitigation Action 2	Encourage citizens and businesses/industries to develop emergency preparedness plans.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Graham
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City will continue to work with Alamance County Emergency Management to promote emergency preparedness plans with its citizens as well as businesses and other stakeholders.

¹ The previously adopted mitigation actions for the City of Graham did not originally correlate with the new regional mitigation goals developed as part of the 2015 plan update because the 2015 goals did not exist at the time of the last plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan where applicable.

Mitigation Action 3		Encourage homeowners to review insurance policies as part of an overall family disaster plan.
Goal:	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	City of Graham	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff time	
Implementation Schedule:	By July 2017	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The City is working on an Emergency Preparedness page in conjunction with the County to be put on the City website to help inform local residents. Projected completion date of July 2017.	

Mitigation Action 4		Increase awareness of the natural hazards potential to local officials, the general public, and private industry.
Goal:	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	City of Graham	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff time	
Implementation Schedule:	July 2017	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	This will be incorporated into the City's website and a link will be added to the County's Emergency Preparedness webpage. Projected completion date of July 2017.	

Mitigation Action 5	Maintain hazard mitigation plan and floodplain information on the County website (www.alamance-nc.com).
Goal:	#6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Graham
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City maintains information on the County website concerning the Hazard Mitigation Plan, NFIP, etc.

Mitigation Action 6	Maintain shelter agreements with the American Red Cross.
Goal:	#1; #5
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County Emergency Management
Estimated Cost:	Unknown
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Graham works with Alamance County Emergency Management in maintaining an up-to-date shelter agreement with the local Red Cross. American Red Cross maintains shelter agreements with facilities for local emergency shelters per their guidelines. These agreements are reviewed annually by American Red Cross.

Mitigation Action 7	Review methods of school construction to ensure that all new schools are constructed to the maximum cost feasible standards of wind resistance, flood resistance, and access so that they can be used as shelters for evacuees during and after natural hazard events.
Goal:	#4
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Graham
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Graham Planning Department reviews plans for all new and existing structures for this. No new schools were constructed within the last five years (2010-2015). No new schools are projected to be constructed within the next five years (2015-2020).

Mitigation Action 8	Review the subdivision regulations and make appropriate changes to encourage alternatives to placing lots in flood-prone areas and to minimize impervious surface coverings, if necessary.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Graham
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	The City has adopted the Flood Damage Prevention Ordinance, Phase II NPDES Stormwater Regulations, and Jordan Lake Riparian Buffer Ordinance.

Mitigation Action 9	Discourage the public and developers from developing property in flood zones.
Goal:	#1; #6
Category:	Local Plans and Regulations; Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Graham
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Implemented through working closely with Alamance County Planning Department and review process. By working with developers and property owners, Alamance County hopes to dramatically decrease the potential for property being developed that would contribute to vast flooding situations thereby decreasing dollar loss to stakeholders.

Mitigation Action 10	Propose a policy prohibiting the development of critical public facilities in the 100-year floodplain in cases where viable alternatives exist. Presently, most critical facilities located in the floodplain are waste pump stations because they must be located at low elevations because they handle gravity flowing sewage.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Graham Public Works Department
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City works alongside the County to coordinate an inventory for all public facilities and identify the ones that are within the 100-year floodplain.

Mitigation Action 11	Consider expanding the County's Geographic Information System (GIS) capabilities to include maintaining Elevation Certificates in a computer database.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County GIS Department
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City will continue to work with Alamance County GIS on maintaining this.

Mitigation Action 12	Continue City of Graham's participation in the National Flood Insurance Program (NFIP) so citizens are eligible for flood insurance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Graham
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Graham will continue participation so its citizens are eligible for flood insurance.

Mitigation Action 13	Develop specific regulations that prohibit dumping in the county's watersheds.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County; City of Graham
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Graham follows Alamance County's lead in strictly enforcing any regulations/laws that pertain to any illegal dumping whatsoever into the county waterways/sheds.

Mitigation Action 14	Maintain documents about flood insurance, flood protection, floodplain management, and natural and beneficial functions of floodplains at the local libraries and government offices.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Graham
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City provides information to its citizens at the local Town Hall on documentation on flooding, etc.

Mitigation Action 15	Maintain GIS system at www.alamance-nc.com. From this site anyone from a private citizen, builder, insurance company, etc. can see if a property is located in the 1-percent-annual-chance (100-year) floodplain.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County GIS Department; City of Graham
Estimated Cost:	Unknown
Potential Funding Sources:	County general fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The County GIS website maintains all information pertaining to the City of Graham and its community.

Mitigation Action 16	Monitor recreational facilities located in the floodplain and evaluate flood resistance of county structures.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Graham Public Works Department
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town's Public Works Department will continue to monitor this.

Mitigation Action 17	Monitor reservoirs, lakes, and streams for potential flooding problems and note any unexpected flooding issues.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Graham/Alamance County Emergency Management
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Graham along with Alamance County Emergency Management monitors lakes, reservoirs, rivers, etc. as it pertains to any possibilities of unexpected flooding.

Mitigation Action 18	Put a weather alert radio in each the County School Administration office, County Managers office, Central Communications (CCOMM), and Emergency Operations Center (EOC).
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Graham
Estimated Cost:	None
Potential Funding Sources:	N/A
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	Alamance County completed the installation of weather alert devices in the School Administration office, CCOMM, and EOC in May 2015. The County's Emergency Alert system (NIXLE) will also be utilized as a weather notification system

Mitigation Action 19	Review all fire districts coverage to ensure that there are adequate quantities of water for firefighting purposes and that all water points are maintained on a regular basis.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Fire/Wildfire
Lead Agency/Department Responsible:	City of Graham Fire Department
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	Based on Rating Schedule dictated by Office of State Fire Marshal (OSFM)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Graham Fire Department in conjunction with Alamance County Fire Marshal's Office conducts regular reviews on all ISO requirements for maintaining adequate water for firefighting purposes.

Mitigation Action 20	Meet annually with State Forester for Alamance County to improve coordination of wildfire control and response.
Goal:	#3
Category:	Education and Awareness Programs; Natural Systems Protection
Hazard(s) Addressed:	Wildfire
Lead Agency/Department Responsible:	City of Graham
Estimated Cost:	None
Potential Funding Sources:	None
Implementation Schedule:	Yearly (2015, 2016, 2017, 2018, 2019)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Graham Fire Department meets annually at its local Emergency Services Association meeting with the local State Forester and reviews strategies for wildfire response dependent on local weather predictions.

Mitigation Action 21	Coordinate with the North Carolina Department of Transportation (NCDOT) to maintain adequate and effective snow and ice removal plans by the towns/cities and NCDOT. "Adequate" means that all major thoroughfares are cleared and remain clear within 12 hours of last snowfall.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Winter Weather
Lead Agency/Department Responsible:	City of Graham
Estimated Cost:	Unknown
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City's Utility Department works in conjunction with NCDOT in providing snow removal to all its major roads within 12 hours of last snowfall.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the City of Graham for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Seek funding for the retrofit of critical facilities and Town-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Graham Buildings and Inspections Department; Town of Graham Planning Department; Town of Graham Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding for the installation of backup generators or quick connect hook ups for mobile generators on any newly constructed and existing county critical facilities.
Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Graham Buildings and Inspections Department; Town of Graham Planning Department; Town of Graham Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—Town of Green Level

The Mitigation Action Plan for the Town of Green Level is divided into two subsections:

7.1 Status of Previously Adopted Mitigation Actions

7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the Town of Green Level.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Encourage builders, developers, and architects to become familiar with the National Flood Insurance Program (NFIP) land use and building standards by attending annual workshops presented by the North Carolina Division of Emergency Management (NCEM). This can be accomplished by creating a mailing list and providing it to NCEM to use for its announcements. This task can be further supported by distributing copies of NCEM's announcements from the Alamance County Inspections Department when builders and developers apply for permits.
Goal: ¹	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Green Level
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Green Level will continue to work in conjunction with Alamance County to encourage builders to become familiar with the NFIP.

Mitigation Action 2	Encourage homeowners to review insurance policies as part of an overall family disaster plan.
Goal:	#7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Green Level
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Green Level encourages local homeowners by means of newsletters to stay informed of safety in the home as well as disaster plans as it affects/pertains to their policies.

¹ The previously adopted mitigation actions for the Town of Green Level did not originally correlate with the new regional mitigation goals developed as part of the 2015 plan update because the 2015 goals did not exist at the time of the last plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan where applicable.

Mitigation Action 3	Maintain hazard mitigation plan and floodplain information on the County website (www.alamance-nc.com).
Goal:	#6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Green Level
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	By July 2016
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Green Level will provide a link on the Town website for this information. Projected completion date of July 2016.

Mitigation Action 4	Review the subdivision regulations and make appropriate changes to encourage alternatives to placing lots in flood-prone areas and to minimize impervious surface coverings, if necessary.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Green Level
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town has adopted a Flood Damage Prevention Ordinance and also works with the County GIS/Planning Department in ensuring that subdivision regulations are reviewed and enforced. Continuous monitoring of this Plan ensures compliance.

Mitigation Action 5	Discourage the public and developers from developing property in flood zones.
Goal:	#1; #6
Category:	Local Plans and Regulations; Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Green Level
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Implemented through the Town's review process which also includes the County Inspections Department as well.

Mitigation Action 6	Propose a policy prohibiting the development of critical public facilities in the 100-year floodplain in cases where viable alternatives exist. Presently, most critical facilities located in the floodplain are waste pump stations because they must be located at low elevations because they handle gravity flowing sewage.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Green Level Public Works Department
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town will continue to conduct an inventory of their waste pump stations as the Town has no critical facilities in their district.

Mitigation Action 7	Expand the County's Geographic Information System (GIS) capabilities to include maintaining Elevation Certificates in a computer database.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Low
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Green Level will continue to work with the Alamance County GIS Department on maintenance of this action.

Mitigation Action 8	Continue the Town of Green Level's participation in the National Flood Insurance Program (NFIP) so citizens are eligible for flood insurance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Green Level
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town will continue to participate in the NFIP as well as work with the County on this action.

Mitigation Action 9	Educate citizens to listen for the watches and warnings issued by the National Weather Service.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Green Level
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town utilizes the Alamance County alert system (Nixle) as well as local media, etc. for citizen notification. Continuous education via the Town to enlist citizens to the NIXLE system are ongoing.

Mitigation Action 10	Review all fire districts coverage to ensure that there are adequate quantities of water for firefighting purposes and that all water points are maintained on a regular basis.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Fire/Wildfire
Lead Agency/Department Responsible:	Town of Green Level; Town of Haw River
Estimated Cost:	Unknown
Potential Funding Sources:	General Fund
Implementation Schedule:	Based on Rating Schedule dictated by Office of State Fire Marshal (OSFM)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Green Level contracts with The Town of Haw River for firefighting operations.

Mitigation Action 11	Meet annually with State Forester for Alamance County to improve coordination of wildfire control and response.
Goal:	#3
Category:	Education and Awareness Programs; Natural Systems Protection
Hazard(s) Addressed:	Wildfire
Lead Agency/Department Responsible:	Town of Green Level; Town of Haw River
Estimated Cost:	Unknown
Potential Funding Sources:	General Fund
Implementation Schedule:	Yearly (2015, 2016, 2017, 2018, 2019)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Green Level contracts with The Town of Haw River for any wildfire response and this action is met through Haw River. Haw River Fire Department, along with the local NC Forestry Service, meet monthly (Fire Investigation Task Force) and quarterly.

Mitigation Action 12	Coordinate with the North Carolina Department of Transportation (NCDOT) to maintain adequate and effective snow and ice removal plans by the towns/cities and NCDOT. "Adequate" means that all major thoroughfares are cleared and remain clear within 12 hours of last snowfall.
Goal:	#1; #3
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Winter Weather
Lead Agency/Department Responsible:	Town of Green Level Public Works Department
Estimated Cost:	Unknown
Potential Funding Sources:	General Fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Green Level Public Works Department will continue to work with NCDOT on this.

Mitigation Action 13	When the county land use plan is complete, create a land use map with an overlay of flood hazards and any other natural hazards that can be mapped.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Green Level
Estimated Cost:	N/A
Potential Funding Sources:	General Fund
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Continue to help provide data for Alamance County GIS System.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the Town of Green Level for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Seek funding for the retrofit of critical facilities and Town-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Green Level Buildings and Inspections Department; Town of Green Level Planning Department; Town of Green Level Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding for the installation of backup generators or quick connect hook ups for mobile generators on any newly constructed and existing county critical facilities.
Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Green Level Buildings and Inspections Department; Town of Green Level Planning Department; Town of Green Level Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—Town of Haw River

The Mitigation Action Plan for the Town of Haw River is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the Town of Haw River.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Encourage builders, developers, and architects to become familiar with the National Flood Insurance Program (NFIP) land use and building standards by attending annual workshops presented by the North Carolina Division of Emergency Management (NCEM). This can be accomplished by creating a mailing list and providing it to NCEM to use for its announcements. This task can be further supported by distributing copies of NCEM's announcements from the Alamance County Inspections Department when builders and developers apply for permits.
Goal: ¹	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Haw River
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Haw River, in conjunction with Alamance County, will provide this information as a joint process as they continue to work together in their respective Inspections Departments with builders and developers.

Mitigation Action 2	Encourage citizens and businesses/industries to develop emergency preparedness plans.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Haw River
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town will continue to coordinate efforts with its major businesses as well as its citizens to encourage developing these plans.

¹ The previously adopted mitigation actions for the Town of Haw River did not originally correlate with the new regional mitigation goals developed as part of the 2015 plan update because the 2015 goals did not exist at the time of the last plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan where applicable.

Mitigation Action 3	Encourage homeowners to review insurance policies as part of an overall family disaster plan.
Goal:	#7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Haw River; Alamance County
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Haw River currently works jointly with Alamance County Emergency Management in encouraging homeowners to review as well as stay current on any insurance policy practices and changes that could affect them.

Mitigation Action 4	Increase awareness of the natural hazards potential to local officials, the general public, and private industry.
Goal:	#7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Haw River
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town works with local Emergency Management as well as others to ensure awareness of its citizens.

Mitigation Action 5	Maintain hazard mitigation plan and floodplain information on the County website (www.alamance-nc.com).
Goal:	#6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Haw River
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	By July 2016
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Haw River will add a link on the Town webpage that will alert citizens to the local Hazard Mitigation Plan. Projected completion date of July 2016.

Mitigation Action 6	Maintain shelter agreements with the American Red Cross.
Goal:	#1; #5
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	American Red Cross maintains shelter agreements with facilities for local emergency shelters per their guidelines. These agreements are reviewed annually by American Red Cross.

Mitigation Action 7	Review the subdivision regulations and make appropriate changes to encourage alternatives to placing lots in flood-prone areas and to minimize imperious surface coverings, if necessary.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Haw River
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	The Town of Haw River has adopted the Flood Damage Prevention Ordinance.

Mitigation Action 8	Discourage the public and developers from developing property in flood zones.
Goal:	#1; #6
Category:	Local Plans and Regulations; Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Haw River
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town's review/inspection process in conjunction with Alamance County prevents developers from building in flood-prone zones/areas.

Mitigation Action 9	Propose a policy prohibiting the development of critical public facilities in the 100-year floodplain in cases where viable alternatives exist. Presently, most critical facilities located in the floodplain are waste pump stations because they must be located at low elevations because they handle gravity flowing sewage.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Haw River Public Works Department; Town of Haw River Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town will coordinate an inventory for all public facilities and identify which are within the 100-year floodplain. This is also conducted in conjunction with the Alamance County Planning Department. Projected completion date of July 2017.

Mitigation Action 10	Expand the County's Geographic Information System (GIS) capabilities to include maintaining Elevation Certificates in a computer database.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County GIS Department
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Haw River continues to work in conjunction with Alamance County GIS Department with implementing this. Projected completion date of July 2017.

Mitigation Action 11		Continue Town of Haw River's participation in the National Flood Insurance Program (NFIP) so citizens are eligible for flood insurance.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	Flood	
Lead Agency/Department Responsible:	Town of Haw River	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff time	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The Town of Haw River participates in the NFIP to ensure that its citizens are eligible for flood insurance.	

Mitigation Action 12		Develop specific regulations that prohibit dumping in the county's watersheds.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	Flood	
Lead Agency/Department Responsible:	Town of Haw River; Alamance County Planning Department	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff time	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The Town of Haw River actively implements/supports any regulations or laws concerning illegal dumping into any of the waterways that affect the town or county.	

Mitigation Action 13	Maintain documents about flood insurance, flood protection, floodplain management, and natural and beneficial functions of floodplains at the local libraries and government offices.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Both-Alamance County and Town of Haw River
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	By July 2018
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town will continue to work jointly with the County in attempting to further educate the public in matters pertaining to flooding issues. Projected completion date July 2018.

Mitigation Action 14	Maintain GIS system at www.alamance-nc.com. From this site anyone from a private citizen, builder, insurance company, etc. can see if a property is located in the 1-percent-annual-chance (100-year) floodplain.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Haw River can possibly put a link in the future on the Town website to the County's GIS. Projected completion date of July 2017.

Mitigation Action 15	Monitor recreational facilities located in the floodplain and evaluate flood resistance of county structures.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Haw River Public Works Department
Estimated Cost:	N/A
Potential Funding Sources:	Unknown
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Low
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Haw River Public Works Department will continue to monitor this.

Mitigation Action 16	Monitor reservoirs, lakes, and streams for potential flooding problems and note any unexpected flooding issues.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Haw River
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Since the town is located on the Haw River, monitoring of the river will continue for any potential flood risks within its area.

Mitigation Action 17	Educate citizens to listen for the watches and warnings issued by the National Weather Service.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Haw River
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town works in conjunction with Alamance County in using its Internet alert system, Nixle, and identifying ways citizens can participate in its implementation as well as utilizing local media, etc.

Mitigation Action 18	Review Haw River fire district coverage to ensure that there are adequate quantities of water for firefighting purposes and that all water points are maintained on a regular basis.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Fire; Wildfire
Lead Agency/Department Responsible:	Town of Haw River Fire Department
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	Based on Rating Schedule dictated by Office of State Fire Marshal (OSFM)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Haw River Fire Department ensures this action and works in conjunction with the County Fire Marshal's Office to ensure State compliance as well.

Mitigation Action 19	Meet annually with State Forester for Alamance County to improve coordination of wildfire control and response.
Goal:	#3
Category:	Education and Awareness Programs; Natural Systems Protection
Hazard(s) Addressed:	Wildfire
Lead Agency/Department Responsible:	Town of Haw River Fire Department
Estimated Cost:	Unknown
Potential Funding Sources:	General Fund
Implementation Schedule:	Yearly (2015,2016,2017,2018,2019)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Haw River Fire Department is an active participant in the Alamance County Emergency Services Association and State/Local Forestry meets annually with the association in reference to wildfire responses for the upcoming year, especially in terms of weather conditions.

Mitigation Action 20	Coordinate with the North Carolina Department of Transportation (NCDOT) to maintain adequate and effective snow and ice removal plans by the towns/cities and NCDOT. "Adequate" means that all major thoroughfares are cleared and remain clear within 12 hours of last snowfall.
Goal:	#1; #3
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Winter Weather
Lead Agency/Department Responsible:	Town of Haw River Public Works Department
Estimated Cost:	Unknown
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town's Public Works Department works diligently with NCDOT on this.

Mitigation Action 21	When the county land use plan is complete, create a land use map with an overlay of flood hazards and any other natural hazards that can be mapped.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Haw River
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	By July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Continue to assist/provide data for Alamance County GIS Department.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the Town of Haw River for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Seek funding for the retrofit of critical facilities and Town-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Haw River Buildings and Inspections Department; Town of Haw River Planning Department; Town of Haw River Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding for the installation of backup generators or quick connect hook ups for mobile generators on any newly constructed and existing town critical facilities.
Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Haw River Buildings and Inspections Department; Town of Haw River Planning Department; Town of Haw River Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—City of Mebane

The Mitigation Action Plan for the City of Mebane is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the City of Mebane.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Encourage builders, developers, and architects to become familiar with the National Flood Insurance Program (NFIP) land use and building standards by attending annual workshops presented by the North Carolina Division of Emergency Management (NCEM). This can be accomplished by creating a mailing list and providing it to NCEM to use for its announcements. This task can be further supported by distributing copies of NCEM's announcements from the Alamance County Inspections Department when builders and developers apply for permits.
Goal: ¹	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Mebane Planning, Zoning and Inspections Department
Estimated Cost:	N/A
Potential Funding Sources:	Staff Time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In progress
Narrative Explanation:	City of Mebane Planning, Zoning, and Inspections Department, in conjunction with Alamance County, will provide this information as a joint process as we continue to work together with different builders and developers.

¹ The previously adopted mitigation actions for the City of Mebane did not originally correlate with the new regional mitigation goals developed as part of the 2015 plan update because the 2015 goals did not exist at the time of the last plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan where applicable.

Mitigation Action 2		Encourage citizens and businesses/industries to develop emergency preparedness plans.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	City of Mebane	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff Time	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In progress	
Narrative Explanation:	<p>The City will coordinate efforts with all major businesses as well as its current citizens in an effort to develop Emergency Preparedness Plans. The Local Emergency Planning Committee (LEPC) and Alamance County Emergency Management (EM) aggressively implement Emergency Action Plans (EAPs) as new and existing businesses operate in Mebane. Current Business/Industry EAPs are reviewed at Tier II submittal. Citizen EAPs are provided by Alamance County EM and the City via local community meetings, planned community outreach programs, and local civic organizations. This is an ongoing mitigation effort.</p>	

Mitigation Action 3		Encourage homeowners to review insurance policies as part of an overall family disaster plan.
Goal:	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	City of Mebane	
Estimated Cost:	None	
Potential Funding Sources:	Staff Time	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	<p>The City works jointly with Alamance County EM encouraging all homeowners to annually review, as well as stay current on, any insurance policy practices and any changes that could affect them.</p>	

Mitigation Action 4		Increase awareness of the natural hazards potential to local officials, the general public, and private industry.
Goal:	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	City of Mebane	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff Time	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The City continually works with Alamance County EM, as well as others, to ensure the continued awareness of its citizens. Alamance County EM is enhancing public awareness of natural hazards through continued use of advanced technology such as social media, Nixle, etc.	

Mitigation Action 5		Maintain hazard mitigation plan and floodplain information on the County website (www.alamance-nc.com).
Goal:	#6; #7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	City of Mebane	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff time	
Implementation Schedule:	Current date range of 2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/ In Progress	
Narrative Explanation:	The City will add a link on the City website that will redirect citizens of Mebane to Alamance County's webpage which contains the latest Hazard Mitigation Plan.	

Mitigation Action 6	Maintain shelter agreements with the American Red Cross.
Goal:	#1; #5
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County; City of Mebane
Estimated Cost:	N/A
Potential funding sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	American Red Cross maintains shelter agreements with facilities for local emergency shelters per their guidelines. These agreements are reviewed annually by American Red Cross. Alamance County EM will be the lead entity on sheltering agreements that would affect the City of Mebane. The City would still provide any needed assistance and resources that would be feasible.

Mitigation Action 7	Review methods of school construction to ensure that all new schools are constructed to the maximum cost feasible standards of wind resistance, flood resistance, and access so that they can be used as shelters for evacuees during and after natural hazard events.
Goal:	#4
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City will review the blueprints when submitted to ensure that all new schools are shelter worthy. No new schools were constructed within the last five years (2010-2015). No new schools are scheduled for construction within the next five years (2015-2020).

Mitigation Action 8	Review the subdivision regulations and make appropriate changes to encourage alternatives to placing lots in flood-prone areas and to minimize imperious surface coverings, if necessary.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Mebane, in conjunction with our City Engineer, Planning, Zoning, and Inspections Departments, will review all subdivision regulations and make any necessary changes to encourage alternatives to placing any lots in flood-prone areas.

Mitigation Action 9	Discourage the public and developers from developing property in flood zones.
Goal:	#1; #6
Category:	Local Plans and Regulations; Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Mebane, in conjunction with our City Engineer, Planning, Zoning, and Inspections Departments, will review all subdivision regulations and make any necessary changes to encourage alternatives to placing any lots in flood-prone areas.

Mitigation Action 10	Look for opportunities to acquire or relocate structures vulnerable to floods.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Low
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City may possibly be able to relocate structures and would utilize hazard mitigation grants if possible.

Mitigation Action 11	Monitor structures affected by flood and track damages and repair costs. If damages and repair costs are high relative to the value of the structure, consider mitigation including elevation, acquisition, or floodproofing.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	N/A
Potential Funding Sources:	The City of Mebane would utilize hazard mitigation grants for this action
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Low
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	There have been no actions taken in the last five years (2010-2015). Moving forward, the City will continue to monitor properties and impacts for potential mitigation projects.

Mitigation Action 12	Propose a policy prohibiting the development of critical public facilities in the 100-year floodplain in cases where viable alternatives exist. Presently, most critical facilities located in the floodplain are waste pump stations because they must be located at low elevations because they handle gravity flowing sewage.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Mebane Public Works and Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	Projected completion date July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City, in conjunction with the Alamance County Planning Department, will coordinate an inventory for all public facilities and will also identify which ones are within the 100-year floodplain. We will also utilize our Zoning and Inspection Departments in completing this action.

Mitigation Action 13	Expand the County's Geographic Information System (GIS) capabilities to include maintaining Elevation Certificates in a computer database.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County; City of Mebane
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City will continue to work in conjunction with Alamance County's GIS Department with implementing this action. We have added a link on the City's website to redirect any visitors to Alamance County's website.

Mitigation Action 14	Continue Alamance County's participation in the National Flood Insurance Program (NFIP) so citizens are eligible for flood insurance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City participates in the NFIP to continue to ensure that the citizens of Mebane are eligible for flood insurance.

Mitigation Action 15	Develop specific regulations that prohibit dumping in the county's watersheds.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City continues to implement and also support all regulations or laws concerning any illegal dumping into or around any of the waterways that affect the City of Mebane or Alamance County.

Mitigation Action 16	Maintain documents about flood insurance, flood protection, floodplain management, and natural and beneficial functions of floodplains at the local libraries and government offices.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Mebane and Alamance County
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City will continue to work in partnership with Alamance County in attempting to further educate the citizens of the City in matters pertaining to any surrounding flooding issues or concerns.

Mitigation Action 17	Maintain GIS system at www.alamance-nc.com. From this site anyone from a private citizen, builder, insurance company, etc. can see if a property is located in the 1-percent-annual-chance (100-year) floodplain.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County
Estimated Cost:	None
Potential Funding Sources:	Staff time
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	The City has added a link on the City's webpage to redirect citizens who may inquire to Alamance County's website.

Mitigation Action 18		Monitor recreational facilities located in the floodplain and evaluate flood resistance of county structures.
Goal:	#4	
Category:	Structure and Infrastructure Projects	
Hazard(s) Addressed:	Flood	
Lead Agency/Department Responsible:	City of Mebane	
Estimated Cost:	None	
Potential Funding Sources:	General fund	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Low	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The City of Mebane and the Mebane Recreation Department will continue to monitor this Mitigation Action.	

Mitigation Action 19		Monitor reservoirs, lakes, and streams for potential flooding problems and note any unexpected flooding issues.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	Flood	
Lead Agency/Department Responsible:	City of Mebane	
Estimated Cost:	None	
Potential Funding Sources:	Staff time	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The City will continue to monitor any areas that are known to be flood-prone or have ever presented any flood risks.	

Mitigation Action 20	Provide local real estate agents with handouts that will advise potential buyers to investigate the flood hazard for the property they are considering purchasing.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	None
Potential Funding Sources:	Staff time
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Low
2015 Status:	Completed
Narrative Explanation:	The City will continue to work in conjunction with Alamance County on this action. The City does currently provide handouts to local real estate agents.

Mitigation Action 21	Educate citizens to listen for the watches and warnings issued by the National Weather Service.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	Unknown
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City will continue to utilize its Code Red Emergency Alert system to alert the citizens that are located inside the city limits of Mebane. The City will start to utilize Nixle for the citizens who lay in the area outside of the city limits of Mebane but inside of Mebane's fire district. This is the same emergency alert system that Alamance County utilizes.

Mitigation Action 22	Review all fire districts coverage to ensure that there are adequate quantities of water for firefighting purposes and that all water points are maintained on a regular basis.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Fire/Wildfire
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	Based on Rating Schedule dictated by Office of State Fire Marshal (OSFM)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Mebane, in conjunction with Alamance County, continues to work jointly with the Alamance County Fire Marshal's Office to ensure state compliance.

Mitigation Action 23	Meet annually with State Forester for Alamance County to improve coordination of wildfire control and response.
Goal:	#3
Category:	Education and Awareness Programs; Natural Systems Protection
Hazard(s) Addressed:	Wildfire
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	Yearly (2015, 2016, 2017, 2018, 2019)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City is an active member of the Alamance County Emergency Services Association. The North Carolina Forestry Service meets annually with the association in reference to wildfire responses to whatever the weather may dictate.

Mitigation Action 24	Coordinate with the North Carolina Department of Transportation (NCDOT) to maintain adequate and effective snow and ice removal plans by the towns/cities and NCDOT. "Adequate" means that all major thoroughfares are cleared and remain clear within 12 hours of last snowfall.
Goal:	#1; #3
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Winter Weather
Lead Agency/Department Responsible:	City of Mebane Public Works Department
Estimated Cost:	Unknown
Potential Funding Sources:	General fund
Implementation Schedule:	As needed, depending on weather situations
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City of Mebane's Public Works Department works in conjunction with NCDOT in completing this Mitigation Action.

Mitigation Action 25	When the county land use plan is complete, create a land use map with an overlay of flood hazards and any other natural hazards that can be mapped.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The City will continue to work with the GIS Department of Alamance County to provide any data that may be needed for this action.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the City of Mebane for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Seek funding for the retrofit of critical facilities and City-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding for the installation of backup generators or quick connect hook ups for mobile generators on any newly constructed and existing city critical facilities.
Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City of Mebane
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—Town of Ossipee

The Mitigation Action Plan for the Town of Ossipee is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the Town of Ossipee.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1		Encourage homeowners to review insurance policies as part of an overall family disaster plan.
Goal: ¹	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Town of Ossipee	
Estimated Cost:	None	
Potential Funding Sources:	Staff time	
Implementation Schedule:	By July 2017	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The Town of Ossipee encourages homeowners to continually review/update homeowner's policies.	

Mitigation Action 2		Increase awareness of the natural hazards potential to local officials, the general public, and private industry.
Goal:	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Town of Ossipee	
Estimated Cost:	None	
Potential Funding Sources:	N/A	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The Town of Ossipee participates in conjunction with Alamance County, the LEPC, local media, etc. in making the general public and business owners aware of potential hazards.	

¹ The previously adopted mitigation actions for Alamance County did not originally correlate with the new regional mitigation goals developed as part of the 2015 plan update because the 2015 goals did not exist at the time of the last plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan where applicable.

Mitigation Action 3		Maintain hazard mitigation plan and floodplain information on the County website (www.alamance-nc.com).
Goal:	#6; #7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Town of Ossipee	
Estimated Cost:	N/A	
Potential Funding Sources:	N/A	
Implementation Schedule:	By July 2016	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The Town will add a link on the Town website to the Hazard Mitigation Plan on the County website. Projected completion date June 2016.	

Mitigation Action 4		Expand the County's Geographic Information System (GIS) capabilities to include maintaining Elevation Certificates in a computer database.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	Flood	
Lead Agency/Department Responsible:	Town of Ossipee	
Estimated Cost:	N/A	
Potential Funding Sources:	N/A	
Implementation Schedule:	By July 2017	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The Town will continue to work with the Alamance County GIS Department for an implementation date of July 2017.	

Mitigation Action 5	Maintain GIS system at www.alamance-nc.com. From this site anyone from a private citizen, builder, insurance company, etc. can see if a property is located in the 1-percent-annual-chance (100-year) floodplain.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Ossipee
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	By July 2016
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town will add a link on the Town's website to the County's GIS. Projected completion date of July 2016.

Mitigation Action 6	Monitor reservoirs, lakes, and streams for potential flooding problems and note any unexpected flooding issues.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Ossipee
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town as well as the County will continue to monitor for any potential flood risks within the town district.

Mitigation Action 7	Educate citizens to listen for the watches and warnings issued by the National Weather Service.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Ossipee
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town is working with Alamance County to promote the county alert system Nixle by enrolling citizens in this notification system.

Mitigation Action 8	Review all fire districts coverage to ensure that there are adequate quantities of water for firefighting purposes and that all water points are maintained on a regular basis.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Fire/Wildfire
Lead Agency/Department Responsible:	Town of Ossipee
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Based on Rating Schedule dictated by Office of State Fire Marshal (OSFM)	Based on Rating Schedule dictated by Office of State Fire Marshal (OSFM)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Alamance County will continue to coordinate this with the Town of Ossipee's Fire Department (A-O FD).

Mitigation Action 9	Meet annually with State Forester for Alamance County to improve coordination of wildfire control and response.
Goal:	#3
Category:	Education and Awareness Programs; Natural Systems Protection
Hazard(s) Addressed:	Wildfire
Lead Agency/Department Responsible:	Town of Ossipee
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	Yearly (2015,2016, 2017, 2018, 2019)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	This action is conducted annually at the local Emergency Services Association of Alamance County.

Mitigation Action 10	When the county land use plan is complete, create a land use map with an overlay of flood hazards and any other natural hazards that can be mapped.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Ossipee
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town will continue to help provide data for the Alamance County GIS system.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the Town of Ossipee for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Seek funding for the retrofit of critical facilities and Town-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Ossipee
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding for the installation of backup generators or quick connect hook ups for mobile generators on any newly constructed and existing town critical facilities.
Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Ossipee
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—Town of Swepsonville

The Mitigation Action Plan for the Town of Swepsonville is divided into two subsections:

7.1 Status of Previously Adopted Mitigation Actions

7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the Town of Swepsonville.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Encourage builders, developers, and architects to become familiar with the National Flood Insurance Program (NFIP) land use and building standards by attending annual workshops presented by the North Carolina Division of Emergency Management (NCEM). This can be accomplished by creating a mailing list and providing it to NCEM to use for its announcements. This task can be further supported by distributing copies of NCEM's announcements from the Alamance County Inspections Department when builders and developers apply for permits.
Goal:	#6
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Swepsonville
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Both Alamance County and the Town of Swepsonville work together to ensure that developers are up-to-date when applying for permits and by attending workshops.

Mitigation Action 2	Encourage citizens and businesses/industries to develop emergency preparedness plans.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Swepsonville
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	July 2017
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town will continue to work with Alamance County Emergency Management to promote emergency preparedness plans with its citizens as well as businesses and other stakeholders.

Mitigation Action 3		Encourage homeowners to review insurance policies as part of an overall family disaster plan.
Goal:	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Town of Swepsonville	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff time	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The Town is working on an Emergency Preparedness page in conjunction with the County to be put on the Town website to help inform local residents.	

Mitigation Action 4		Increase awareness of the natural hazards potential to local officials, the general public, and private industry.
Goal:	#7	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Town of Swepsonville	
Estimated Cost:	N/A	
Potential Funding Sources:	Staff time	
Implementation Schedule:	July 2017	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	This will be incorporated into the Town website and a link will be added to the County's Emergency Preparedness webpage. Projected completion July 2017.	

Mitigation Action 5	Maintain hazard mitigation plan and floodplain information on the County website (www.alamance-nc.com).
Goal:	#6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Swepsonville
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town maintains information on the County website concerning the Hazard Mitigation Plan, NFIP, etc.

Mitigation Action 6	Maintain shelter agreements with the American Red Cross.
Goal:	#1; #5
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Alamance County Emergency Management; Town of Swepsonville
Estimated Cost:	Unknown
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Swepsonville works with Alamance County EM in maintaining an up-to-date shelter agreement with the American Red Cross. The American Red Cross maintains agreements with local facilities as emergency shelters. Those agreements are reviewed annually.

Mitigation Action 7	Review the subdivision regulations and make appropriate changes to encourage alternatives to placing lots in flood-prone areas and to minimize imperious surface coverings, if necessary.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Swepsonville
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town has adopted the Flood Damage Prevention Ordinance, Phase II NPDES Stormwater Regulations, and Jordan Lake Riparian Buffer Ordinance.

Mitigation Action 8	Discourage the public and developers from developing property in flood zones.
Goal:	#1; #6
Category:	Local Plans and Regulations; Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Swepsonville
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	This action is implemented by the Town by working closely with the Alamance County Planning Department and the County review process.

Mitigation Action 9	Propose a policy prohibiting the development of critical public facilities in the 100-year floodplain in cases where viable alternatives exist. Presently, most critical facilities located in the floodplain are waste pump stations because they must be located at low elevations because they handle gravity flowing sewage.
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Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Swepsonville Public Works Department
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town works alongside the County to coordinate an inventory for all public facilities and identify the ones that are within the 100-year floodplain.

Mitigation Action 10	Expand the County's Geographic Information System (GIS) capabilities to include maintaining Elevation Certificates in a computer database.
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Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County GIS
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town will continue to work with Alamance County GIS on maintaining this.

Mitigation Action 11	Continue Town of Swepsonville's participation in the National Flood Insurance Program (NFIP) so citizens are eligible for flood insurance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Swepsonville
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Swepsonville will continue participation so its citizens are eligible for flood insurance.

Mitigation Action 12	Develop specific regulations that prohibit dumping in the county's watersheds.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Swepsonville follows the County's lead in strictly enforcing any regulations/laws that pertain to any illegal dumping whatsoever into the county waterways/sheds.

Mitigation Action 13	Maintain documents about flood insurance, flood protection, floodplain management, and natural and beneficial functions of floodplains at the local libraries and government offices.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Swepsonville
Estimated Cost:	N/A
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town provides information to its citizens at the local Town Hall on documentation on flooding, etc.

Mitigation Action 14	Maintain GIS system at www.alamance-nc.com. From this site anyone from a private citizen, builder, insurance company, etc. can see if a property is located in the 1-percent-annual-chance (100-year) floodplain.
Goal:	#1; #6; #7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Alamance County GIS Department
Estimated Cost:	Unknown
Potential Funding Sources:	County general fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The County GIS website maintains all information pertaining to the Town of Swepsonville and its community.

Mitigation Action 15	Monitor recreational facilities located in the floodplain and evaluate flood resistance of county structures.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Swepsonville Public Works Department
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town Public Works Department will continue to monitor this.

Mitigation Action 16		Monitor reservoirs, lakes, and streams for potential flooding problems and note any unexpected flooding issues.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	Flood	
Lead Agency/Department Responsible:	Town of Swepsonville; Alamance County	
Estimated Cost:	N/A	
Potential Funding Sources:	General fund	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The Town of Swepsonville along with Alamance County Emergency Management monitor lakes, reservoirs, rivers, etc. as it pertains to any possibilities of unexpected flooding. Alamance County reservoirs are assessed each year for potential problems as well as security issues.	

Mitigation Action 17		Put a weather alert radio in each school, day care, nursing home, rest home, and government building.
Goal:	#6	
Category:	Education and Awareness Programs	
Hazard(s) Addressed:	All	
Lead Agency/Department Responsible:	Town of Swepsonville	
Estimated Cost:	None	
Potential Funding Sources:	N/A	
Implementation Schedule:	Completed	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Completed	
Narrative Explanation:	Alamance County Emergency Management placed Weather Radios in the school administration office, County Manager's office, Central Communications, and Emergency Operations Center in May 2015.	

Mitigation Action 18	Review all fire districts coverage to ensure that there are adequate quantities of water for firefighting purposes and that all water points are maintained on a regular basis.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Fire/Wildfire
Lead Agency/Department Responsible:	Town of Swepsonville Fire Department
Estimated Cost:	N/A
Potential Funding Sources:	Staff time
Implementation Schedule:	Based on Rating Schedule dictated by Office of State Fire Marshal (OSFM)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Swepsonville Fire Department in conjunction with Alamance County Fire Marshal's Office conduct regular reviews on all ISO requirements for maintaining adequate water for firefighting purposes.

Mitigation Action 19	Meet annually with State Forester for Alamance County to improve coordination of wildfire control and response.
Goal:	#3
Category:	Education and Awareness Programs; Natural Systems Protection
Hazard(s) Addressed:	Wildfire
Lead Agency/Department Responsible:	Town of Swepsonville Fire Department
Estimated Cost:	None
Potential Funding Sources:	None
Implementation Schedule:	Yearly (2015, 2016, 2017, 2018, 2019)
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Swepsonville Fire Department meets annually at its local Emergency Services Association meeting with the local State Forester and reviews strategies for wildfire response dependent on local weather predictions.

Mitigation Action 20	Coordinate with the North Carolina Department of Transportation (NCDOT) to maintain adequate and effective snow and ice removal plans by the towns/cities and NCDOT. "Adequate" means that all major thoroughfares are cleared and remain clear within 12 hours of last snowfall.
Goal:	#1; #3
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Winter Weather
Lead Agency/Department Responsible:	Town of Swepsonville
Estimated Cost:	Unknown
Potential Funding Sources:	General fund
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town's Utility Department works in conjunction with NCDOT in providing snow removal to all its major roads within 12 hours of last snowfall. Efforts are also coordinated with the Alamance County Emergency Management Office.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the Town of Swepsonville for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Seek funding for the retrofit of critical facilities and Town-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
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Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Swepsonville
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding for the installation of backup generators or quick connect hook ups for mobile generators on any newly constructed and existing town critical facilities.
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Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Swepsonville
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—Orange County

The Mitigation Action Plan for Orange County is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for Orange County.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Orange County continues to work with State and Federal agencies to complete new floodplain mapping within its jurisdiction. Orange County development regulations do not permit new structures to be constructed in floodplain areas.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Orange County Planning and Inspections Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	New flood maps were issued to the County in October 2014 and are currently being enforced by County staff. However, the new maps have not been adopted or implemented into the Orange County Zoning Atlas at this time. New flood maps are scheduled for adoption by the Orange County Board of Commissioners in September 2015.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for Orange County for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Continue implementation of the Orange County 2030 Comprehensive Plan.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Orange County Planning and Inspections Department
Estimated Cost:	N/A
Potential Funding Sources:	General Fund (existing staff salaries)
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Continue enforcement of the North Carolina State Building Code.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Orange County Planning and Inspections
Estimated Cost:	N/A
Potential Funding Sources:	General Fund (existing staff salaries)
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High

Mitigation Action 3	Continue participation in the Community Rating System (CRS) and annual recertification in order to increase public safety, reduce property damage, avoid economic loss, and allow for a decrease in flood insurance premiums for Orange County residents.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood, Hurricane and Tropical Storm
Lead Agency/Department Responsible:	Orange County Planning and Inspections Department
Estimated Cost:	N/A
Potential Funding Sources:	General Fund (existing staff salaries)
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High

Mitigation Action 4	Continue participation in the National Flood Insurance Program (NFIP) to reduce the impact of a future flood event, mitigate effects of flooding, and allow citizens to be eligible for affordable flood insurance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood, Hurricane and Tropical Storm
Lead Agency/Department Responsible:	Orange County Planning and Inspections Department
Estimated Cost:	N/A
Potential Funding Sources:	General Fund (existing staff salaries)
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High

Mitigation Action 5	Strive to ensure future development occurs in a manner that protects floodplains, streams, wetlands, and other natural features which work to reduce flood hazard susceptibility and continue to enforce existing regulations pertaining to stormwater management and erosion control standards contained within the Orange County Unified Development Ordinance
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood, Hurricane and Tropical Storm
Lead Agency/Department Responsible:	Orange County Planning and Inspections Department
Estimated Cost:	N/A
Potential Funding Sources:	General Fund (existing staff salaries)
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High

Mitigation Action 6	Continue to enforce floodplain regulations through the county's Special Flood Hazard Area (SFHA) Overlay District contained within the Orange County Unified Development Ordinance and continue training efforts for the Certified Floodplain Manager (CFM).
Goal:	#1,#7
Category:	Local Plans and Regulations, Education and Awareness
Hazard(s) Addressed:	Flood, Hurricane and Tropical Storm
Lead Agency/Department Responsible:	Orange County Planning and Inspections Department
Estimated Cost:	N/A
Potential Funding Sources:	General Fund (existing staff salaries)
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High

Mitigation Action 7	Provide staff support and information on Orange County's website to provide education and assistance to residents experiencing floodplain, stormwater, and erosion control issues.
Goal:	#7
Category:	Education and Awareness
Hazard(s) Addressed:	Flood, Hurricanes and Tropical Storm
Lead Agency/Department Responsible:	Orange County Planning and Inspections Department
Estimated Cost:	N/A
Potential Funding Sources:	General Fund (existing staff salaries)
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 8	Provide education and outreach to Orange County residents in order to increase awareness of natural hazard potential in the county and maintain a link to the Eno-Haw Regional Hazard Mitigation Plan on Orange County's website.
Goal:	#6, #7
Category:	Education and Awareness
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Orange County Planning and Inspections Department; Emergency Services
Estimated Cost:	N/A
Potential Funding Sources:	General Fund (existing staff salaries)
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 9	Engage in regional events, activities, and training opportunities related to natural hazards in order to improve communication, enhance partnerships, and improve planning efforts with other local jurisdictions.
Goal:	#3, #7
Category:	Education and Awareness
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Emergency Services
Estimated Cost:	N/A
Potential Funding Sources:	General Fund (existing staff salaries)
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 10	Strive to improve communication and outreach to Orange County residents before, during, and after a hazard weather event with the county's website, press releases, social media accounts, and the OC Alerts system in order to keep residents informed and improve public safety in and around the county.
Goal:	#3
Category:	Education and Awareness
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Emergency Services
Estimated Cost:	N/A
Potential Funding Sources:	General Fund (existing staff salaries)
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 11	Explore the possibility of retrofitting existing critical facilities with back-up generators.
Goal:	#4, #5
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Emergency Services, Asset Management Services
Estimated Cost:	N/A
Potential Funding Sources:	Unified Hazard Mitigation Assistance (UHMA)
Implementation Schedule:	2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 12	Explore the possibility of retrofitting critical facilities to harden against high winds and lightning.
Goal:	#4, #5
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Emergency Services, Asset Management Services
Estimated Cost:	N/A
Potential Funding Sources:	Unified Hazard Mitigation Assistance (UHMA)
Implementation Schedule:	2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 13	Conduct a cost-benefit review during the planning and design phase of construction of new government owned facilities or critical facilities to determine the feasibility of equipping the facility with back-up generators, lightning protection, high wind protection, and/or 361 compliant tornado shelters.
Goal:	#4, #5
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Emergency Services, Asset Management Services
Estimated Cost:	N/A
Potential Funding Sources:	Unified Hazard Mitigation Assistance (UHMA)
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—Town of Carrboro

The Mitigation Action Plan for the Town of Carrboro is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the Town of Carrboro.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	The Town of Carrboro, as a member of the Orange County Hazard Mitigation Planning Team, will coordinate with Orange County to reevaluate and update its hazard mitigation planning component at least once every five years or sooner as deemed appropriate by the Orange County Planning Director.
Goal: ¹	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Orange County; Town of Carrboro
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	Every five years—next plan update will be in 2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Carrboro has recently participated not only with Orange County but also with Alamance and Durham counties on the development of the new regional hazard mitigation plan for the three counties.

Mitigation Action 2	The Town of Carrboro intends to submit a Community Rating System (CRS) application to the ISO for a flood insurance rating that will benefit owners of flood-prone properties.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Carrboro Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Deferred
Narrative Explanation:	The Town of Carrboro continues to consider submitting a CRS application. Previous exploration has not presented a clear positive cost/benefit to the community, due to the low number of insured properties and the extensive commitment of the CRS program. The Town remains committed to evaluating the program and benefits, particularly in relation to the updated insurance rate structure and intends to do so as soon as it can be accomplished; likely within the five-year timeframe of this plan update.

¹ The previously adopted mitigation actions for the Town of Carrboro did not originally correlate with the new regional mitigation goals developed as part of the 2015 plan update because the 2015 goals did not exist at the time of the last plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan where applicable.

Mitigation Action 3	The Town of Carrboro will continue to monitor ongoing efforts by the State and the US Army Corps of Engineers to complete new floodplain mapping for the planning area. Local staff resources will be needed to implement and encourage the completion of these activities.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Carrboro Planning Department; Town Engineer; Town of Chapel Hill Engineering Department
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2016
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Preliminary mapping has been carried out and public comment period completed. New mapping information is expected to be effective within the year (2015-2016).

Mitigation Action 4	The Town of Carrboro needs assistance and support for the development of greenways and parklands dedicated to public use along streams and easements. The Town will seek to secure funding from federal, state, and local sources to implement the Town's greenway system, which will in turn mitigate flood hazards.
Goal:	#1
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Carrboro Planning Department; Town of Carrboro Recreation Department
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Design has been completed for two projects adjacent to Special Flood Hazard Areas (SFHAs). Construction is expected to proceed on one project in FY 15-16 and a second project in FY 17. Design and construction of one additional project is anticipated during the plan period (2015-2020).

Mitigation Action 5	The Town of Carrboro requires new developments to install electric, cable and telephone wires underground. The older neighborhoods are served by overhead utilities and services fail when fallen trees and or tree limbs break lines. It would be beneficial to locate these utilities underground since the Town has experienced lengthy power outages during ice storms or major storm events such as Hurricane Fran. Retrofitting above ground utilities by placing them underground is beyond the financial means of the Town and could only be accomplished with resources from the utilities and/or with state and federal assistance.
Goal:	#1
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Hurricanes; Tropical Storms; Thunderstorms; Winter Weather
Lead Agency/Department Responsible:	Town of Carrboro Planning Department; Town of Carrboro Public Works Department; Public Utilities
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Funding source not yet identified.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the Town of Carrboro for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Look for opportunities to mitigate repetitive loss structures.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Carrboro Planning Department, Office of the Carrboro Town Manager
Estimated Cost:	Varies
Potential Funding Sources:	HMA; HMGP; with non-Federal matching funds
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Establish comprehensive framework for plans, policies, and regulations pertaining to land use, generally, and the relationship to natural hazard mitigation.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Carrboro Planning Department
Estimated Cost:	Not known
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate-High

Mitigation Action 3	Protect and conserve land with environmental and natural hazard mitigation value as open space.
Goal:	#1
Category:	Natural Resource Protection
Hazard(s) Addressed:	Flood, Hurricane, Landslide
Lead Agency/Department Responsible:	Town of Carrboro Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2025
Priority (High, Moderate, Low):	High

Mitigation Action 4	Seek funding to retrofit critical facilities and Town-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, 320 or 361 compliant safe rooms, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Carrboro Planning Department
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 5	Seek funding to install backup generators or quick connect hook ups for mobile generators on any newly constructed county/town critical facilities.
Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Carrboro Planning Department
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—Town of Chapel Hill

The Mitigation Action Plan for the Town of Chapel Hill is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the Town of Chapel Hill.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a two to three sentence written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Seek opportunities for formal and informal communication with other Triangle Area jurisdictions on regional planning issues related to hazard mitigation.
Goal: ¹	#3
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town of Chapel Hill Office of Emergency Management (EM) routinely engages with emergency management services in surrounding jurisdictions. In 2014, the Town entered into an agreement for a countywide alert system. EM also routinely participates in joint meetings, planning sessions, and briefings with other agencies and jurisdictions.

Mitigation Action 2	Develop a network of greenways with regional connections.
Goal:	#3; #4
Category:	Natural Systems Protection; Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town recently adopted an open space, greenways, and recreation master plan that identifies areas to be conserved for those purposes. A conservation-specific map has not been identified as a local priority at this time.

¹ The previously adopted mitigation actions for the Town of Chapel Hill did not originally correlate with the new regional mitigation goals developed as part of the 2015 plan update because the 2015 goals did not exist at the time of the last plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan where applicable.

Mitigation Action 3	Manage watersheds, stormwater, and water quality.
Goal:	#1
Category:	Natural Systems Protection; Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town is required to comply with the water quality requirements mandated in its NPDES permit as well as in the Jordan Lake TMDL requirements. There are some limited water quantity requirements as well. These programs have been in force since 2004 and 2012, respectively.

Mitigation Action 4	Develop an area-wide map of potential conservation lands.
Goal:	#1
Category:	Local Plans and Regulations; Natural Systems Protection
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town participates in the National Flood Insurance Program and has adopted the Flood Insurance Rate Maps. The Town must comply with the riparian buffer regulations mandated in the Jordan Lake TMDL, which is 50 feet in width measured from the top of bank of intermittent and perennial streams, and perennial waterbodies shown on the paper soil survey map prepared by the Natural Resources Conservation Service (NRCS) of the United States Department of Agriculture or the paper quadrangle topographic maps prepared by the United States Geologic Survey (USGS). The Town also administers a local riparian buffer regulation through its Resource Conservation District overlay zoning. These requirements are applicable to perennial and intermittent streams shown on the Town's Geographic Information System (GIS) coverage, the USGS topographic map, or the soil survey map by the NRCS; they may not be applicable to single-family lots created before 2003 with an intermittent stream determination. The perennial stream buffer width varies from a minimum of 50 feet to 150 feet or the Base Flood Elevation + 3 feet, if a regulatory floodplain is present.

Mitigation Action 5	Consider creative zoning options.
Goal:	#1
Category:	Local Plans and Regulations; Natural Systems Protection
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	In Progress
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town adopted a new zoning district in 2014 identifying approximately 160 acres for redevelopment with the highest storm water regulations in the municipality. This rezoning is a model for current activities elsewhere in the municipality.

Mitigation Action 6	Use Purchase Development Rights, and explore Transfer of Development Rights.
Goal:	#1
Category:	Local Plans and Regulations; Natural Systems Protection
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Deferred
Narrative Explanation:	The Town has been focused on using other zoning tools, such as form based code and development agreements, to achieve its development goals.

Mitigation Action 7	Encourage landowner compacts.
Goal:	#1
Category:	Local Plans and Regulations; Natural Systems Protection
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Deferred
Narrative Explanation:	The Town has been focused on using other zoning tools, such as form based code and development agreements, to achieve its development goals.

Mitigation Action 8	Encourage development of selected “opportunity areas” to achieve Comprehensive Plan objectives.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Future Focus areas were identified in the Comprehensive Plan (adopted in 2012) and small area planning efforts, rezoning, and other development-related activities have been directed by that comprehensive plan.

Mitigation Action 9		Encourage mixed-use development forms.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm	
Lead Agency/Department Responsible:	Town of Chapel Hill	
Estimated Cost:	N/A	
Potential Funding Sources:	N/A	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	<p>The Town has adopted a development agreement for Glen Lennox (a substantial redevelopment area with higher stormwater regulations and greenspace requirements), rezoned the Ephesus District (160 acres) and has continued to emphasize mixed-use redevelopment in the downtown and in future focus areas, as per the comprehensive plan.</p>	

Mitigation Action 10		Preserve open space in residential developments through the application of conservation development principles.
Goal:	#1	
Category:	Local Plans and Regulations	
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm	
Lead Agency/Department Responsible:	Town of Chapel Hill	
Estimated Cost:	N/A	
Potential Funding Sources:	N/A	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	<p>The open space standards in the Town's land use management ordinance continue to be applied and additional open space areas are negotiated during the appropriate development approval processes.</p>	

Mitigation Action 11	Establish a growth management protocol to maintain sufficient infrastructure capacity.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town has an urban services district and a rural buffer, both of which continue to guide development decisions within the municipal boundaries.

Mitigation Action 12	Prepare and adopt small area plans to implement Comprehensive Plan concepts.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	See actions 8 and 9.

Mitigation Action 13	Improve the Development Review process.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	This has been an ongoing effort since 2009; current initiatives include the revision of the Town's land use management ordinance, underway in 2014-2015.

Mitigation Action 14		Preserve land with environmental value as open space.
Goal:	#1	
Category:	Natural Resource Protection	
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm	
Lead Agency/Department Responsible:	Town of Chapel Hill	
Estimated Cost:	N/A	
Potential Funding Sources:	N/A	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	The Town has been focused on using zoning tools, such as form based code and development agreements, to achieve its open space goals.	

Mitigation Action 15		Encourage public and private partnerships to restore and maintain the Town's environmental resources.
Goal:	#1	
Category:	Natural Resource Protection	
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm	
Lead Agency/Department Responsible:	Town of Chapel Hill	
Estimated Cost:	N/A	
Potential Funding Sources:	N/A	
Implementation Schedule:	2015-202	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	These types of partnerships are negotiated on a case-by-case basis when development proposals are made. Recent examples include the two development agreement processes (Glen Lennox – approved; Obey Creek – underway) as well as the efforts to restore the creek in the Ephesus District – recently rezoned.	

Mitigation Action 16		Encourage low-impact development for addressing stormwater quality and quantity concerns.
Goal:	#1	
Category:	Natural Resource Protection	
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm	
Lead Agency/Department Responsible:	Town of Chapel Hill	
Estimated Cost:	N/A	
Potential Funding Sources:	N/A	
Implementation Schedule:	2015-2020	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Partially Completed/In Progress	
Narrative Explanation:	Low impact development measures were included in the Ephesus area rezoning and will be considered during the update of the land use management ordinance (In Progress).	

Mitigation Action 17		Encourage the creation of a stormwater utility to manage these problems.
Goal:	#1	
Category:	Natural Resource Protection	
Hazard(s) Addressed:	Flood; Hurricane; Thunderstorm	
Lead Agency/Department Responsible:	Town of Chapel Hill	
Estimated Cost:	N/A	
Potential Funding Sources:	N/A	
Implementation Schedule:	Completed	
Priority (High, Moderate, Low):	Moderate	
2015 Status:	Completed	
Narrative Explanation:	The Town has had a stormwater utility in place since 2004.	

Mitigation Action 18	Creation of a Community Facilities Plan that would outline plans for providing police, fire, waste services, etc. to areas where growth is expected to occur.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Fire
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Planning underway for new public safety headquarters facility and several new fire stations. Design and location of these facilities to enhance services to areas of growth. Town is reaching limits of developable open space resulting in urban renewal. Fire and Police protection is adapting to high density and high rise construction.

Mitigation Action 19	Continue to enforce the Town's Stormwater Management Program, including: <ol style="list-style-type: none"> 1. Develop and implement a comprehensive Stormwater Program Master Plan that supports all of the stormwater program priorities; 2. Address stormwater quantity (flooding) as an integral component within the program; 3. Address stormwater quality as an integral function within the program; 4. Protect and restore natural stream corridors; 5. Develop a formal public education and involvement program; 6. Define the level of service and performance standards for the Town's Stormwater Program; 7. Ensure compliance with Federal and State regulatory mandates; 8. Establish clear stormwater program leadership that the public recognizes; 9. Integrate programs to utilize resources efficiently; 10. Establish an understanding of the stormwater system as a "utility."
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Chapel Hill
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The list above contains the 10 goals established by the Town Council for the Stormwater Management Program. Goal One, the development of the Stormwater Master Plan, was completed and the Plan was adopted by the Town Council on September 29, 2014.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the Town of Chapel Hill for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Seek funding to retrofit critical facilities and Town-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, 320 or 361 compliant safe rooms, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Chapel Hill Planning Department
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding to install backup generators or quick connect hook ups for mobile generators on any newly constructed county/town critical facilities.
Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Chapel Hill Planning Department
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—Town of Hillsborough

The Mitigation Action Plan for the Town of Hillsborough is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the Town of Hillsborough.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Relocate the Motor Pool operation to a non-floodprone site. This is a sizable project generally beyond the Town's financial capabilities within the next 10 years. Funding assistance is needed to accomplish this action.
Goal: ¹	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Hillsborough Public Works Department
Estimated Cost:	\$1,233,200
Potential Funding Sources:	Town Budget
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	High
2015 Status:	Completed
Narrative Explanation:	The Motor Pool Operation is now located at 890 NC 86 North.

Mitigation Action 2	Relocation of sewer pump stations in critical areas.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Hillsborough Engineering Department
Estimated Cost:	\$500,000
Potential Funding Sources:	Town Budget
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	High
2015 Status:	Completed
Narrative Explanation:	This action was completed 100% in FY2013. Cornwallis Hills Pump Station has been eliminated and its service has been incorporated into another upgraded station.

Mitigation Action 3	Work with the Tree Board, Public Works Department, and utility companies to ensure that dangerous situations are addressed in a timely manner.
Goal:	#3
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Hillsborough Public Works Department
Estimated Cost:	\$20,000
Potential Funding Sources:	Grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	This process is carried out through physical inspection and windshield surveys of problem areas. These activities occur both prior to anticipated events, as well as bi-annually for critical infrastructure.

Mitigation Action 4	Work with State efforts to study hydrology and map/designate any new flood-prone areas.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Hillsborough Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	The Town works with the State to revise flood maps and related data as needed.

Mitigation Action 5	Provide preparedness and mitigation information via TV segments on Channel 18.
Goal:	#7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Fire Marshal; Emergency Management Coordinator
Estimated Cost:	Free access channel provided by Time Warner Cable
Potential Funding Sources:	Public Access Channel \$0.00
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Thus far we have covered fire prevention and sanitary sewer topics in our programs. Flooding is scheduled for July 2015 followed by Personal & Family Preparedness in September 2015.

Mitigation Action 6	Outfit the sewer plant with a generator.
Goal:	#5
Category:	Other
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Hillsborough Engineering Department
Estimated Cost:	\$529,000
Potential Funding Sources:	N/A
Implementation Schedule:	Completed
Priority (High, Moderate, Low):	Moderate
2015 Status:	Completed
Narrative Explanation:	A generator was installed in FY 2012.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the Town of Hillsborough for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Relocate the Public Works operation to a non-floodprone site. This is a sizable project and is expected to be accomplished within the next 5-7 years.
Goal: ²	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Town of Hillsborough Public Works Department
Estimated Cost:	\$1,066,948 (contract pending)
Potential Funding Sources:	Town Budget
Implementation Schedule:	2016-2017
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding to retrofit critical facilities and Town-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, 320 or 361 compliant safe rooms, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Hillsborough Public Works Department
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

² The previously adopted mitigation actions for the Town of Hillsborough did not originally correlate with the new regional mitigation goals developed as part of the 2015 plan update because the 2015 goals did not exist at the time of the last plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan where applicable.

Mitigation Action 3	Seek funding to install backup generators or quick connect hook ups for mobile generators on any newly constructed county/town critical facilities.
Goal:	#4
Category:	Other
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Town of Hillsborough Public Works Department
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local; State Grants; UHMA Grants; other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—Durham County

The Mitigation Action Plan for Durham County is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for Durham County.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Continued enforcement of Flood Damage Prevention Ordinance.
Goal: ¹	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Ordinance is continually enforced. No end date projected.

Mitigation Action 2	Continued participation in the NFIP Community Rating System (CRS) program.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Continual participation required. No end date.

Mitigation Action 3	Continued enforcement of Subdivision Ordinance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood; All Hazards for Ingress and Egress
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Ordinance is continually enforced. No end date projected.

¹ The previously adopted mitigation actions for Durham County did not correlate with the new regional mitigation goals developed as part of the 2015 plan update. However, the new regional goals have been integrated with the previously adopted mitigation actions to bring them into the context of the new regional plan.

Mitigation Action 4	Continued enforcement of County Zoning Ordinance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Ordinance is continually enforced. No end date projected.

Mitigation Action 5	Continued enforcement of County Soil Erosion and Sedimentation Control Ordinance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Durham County Engineering Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Ordinance is continually enforced. No end date projected.

Mitigation Action 6	Continued enforcement of Safe and Sanitary Housing Ordinance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City-County Inspections Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Ordinance is continually enforced. No end date projected.

Mitigation Action 7	Continued enforcement of Fire Prevention/Hazardous Materials Permitting and Storage regulations.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Chemical Accidents
Lead Agency/Department Responsible:	Durham County Fire Marshal
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Fire Prevention Code requires activities to continue on an annual basis.

Mitigation Action 8	Continue tree-trimming programs for storm damage prevention.
Goal:	#5
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Durham County Forestry
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Program continues throughout the jurisdiction continually.

Mitigation Action 9	Continued implementation of Stormwater Management Plan.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Durham County Engineering Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Plan is continually enforced. No end date projected.

Mitigation Action 10	Continued implementation of Comprehensive Plan.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood; geographical hazards
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Plan is continually enforced. No end date projected.

Mitigation Action 11	Continue all aspects of the Floodplain Management Program.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Participation in, and continued enforcement of, program to continue.

Mitigation Action 12	Continued enforcement of state building codes and more stringent local building requirements.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City-County Inspections Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Codes are continually enforced. No end date projected.

Mitigation Action 13	Look for opportunities to mitigate repetitive loss structures.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Durham County Emergency Management
Estimated Cost:	N/A
Potential Funding Sources:	HMGP or PDM with local or State match
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Continuing to search out mitigation opportunities.

Mitigation Action 14	Continue all-hazards public information campaigns.
Goal:	#7
Category:	Education and Awareness Programs
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Durham County Emergency Management
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded but will look for additional support and partners
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Integrated into ongoing emergency management preparedness campaigns.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for Durham County for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Identify and obtain additional properties to increase protected open space as a land-use tool to reduce adverse impacts from floods.
Goal:	#1; #4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	HMGP or PDM with local or State match
Implementation Schedule:	Continuous
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding to retrofit critical facilities and County-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, 320 or 361 compliant safe rooms, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Buildings and Inspections Department; Planning Department; Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local, State Grants, UHMA Grants, other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 3	Seek funding to install backup generators or quick connect hook ups for mobile generators on any newly constructed County critical facilities.
Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Buildings and Inspections Department; Planning Department; Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local, State Grants, UHMA Grants, other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action Plan—City of Durham

The Mitigation Action Plan for the City of Durham is divided into two subsections:

- 7.1 Status of Previously Adopted Mitigation Actions
- 7.2 New 2015 Mitigation Actions

7.1 Status of Previously Adopted Mitigation Actions

This subsection contains all previously adopted mitigation actions for the City of Durham.

The “2015 Status” field provides a one-word description of the status of the mitigation action. Options for this field are:

- Completed
- Completed/To Be Continued
- Partially Completed/In Progress
- Deferred
- Deleted

The “Narrative Explanation” field provides a brief (two to three sentence) written explanation of the status of the action. As examples:

- If the status is “Completed” or “Completed/To Be Continued,” the narrative explanation includes specific dates or other pertinent details providing documentation of the action’s completion. Where applicable, this also includes any notes describing how successful the action has been.
- If the status is “Partially Completed/In Progress,” the narrative explanation will explain where the project is in terms of completion and if there are any barriers to implementation, such as lack of funding.
- If the status is “Deferred” or “Deleted,” the narrative explanation will explain why the action has not been started or why the jurisdiction desires to abandon the action. An example of the type of response provided here could be, “Altered conditions due to disaster events and recovery priorities have postponed or permanently delayed the implementation of the action.” Any deleted actions will remain in this status update section until the next plan update. At that time, the action will be completely removed from the Plan.

Mitigation Action 1	Continued enforcement of Flood Damage Prevention Ordinance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Ordinance is continually enforced.

Mitigation Action 2	Continued enforcement of Subdivision Ordinance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood; All Hazards for Ingress and Egress
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Ordinance is continually enforced.

Mitigation Action 3	Continued enforcement of City Zoning Ordinance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Ordinance is continually enforced.

Mitigation Action 4	Continued enforcement of Soil Erosion and Sedimentation Control Ordinance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Ordinance is continually enforced.

Mitigation Action 5	Continued enforcement of Safe and Sanitary Housing Ordinance.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Durham Housing Authority; City-County Inspections Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Ordinance is continually enforced.

Mitigation Action 6	Continued enforcement of Fire Prevention/Hazardous Materials Permitting and Storage regulations.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Chemical Accidents
Lead Agency/Department Responsible:	Durham Fire Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Fire Prevention Code requires activities to continue on an annual basis.

Mitigation Action 7	Continue all aspects of the Floodplain Management Program.
Goal:	#1 (Reduce damage to built environment from flooding.)
Category:	Local Plans and Regulations
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Participation in, and continued enforcement of, program to continue.

Mitigation Action 8	Continue tree-trimming programs for storm damage prevention.
Goal:	#5 (Reduce the effect of power outages from falling trees and branches.)
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Durham General Services Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Program continues throughout the jurisdiction continually. Major focus on N. Mangum Street in Spring 2015.

Mitigation Action 9	Continued enforcement of state building codes and more stringent local building requirements.
Goal:	#1
Category:	Local Plans and Regulations
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	City-County Inspections Department
Estimated Cost:	N/A
Potential Funding Sources:	Self-funded
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	High
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Codes are continually enforced.

Mitigation Action 10	Look for opportunities to mitigate repetitive loss structures.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	Durham County Emergency Management
Estimated Cost:	N/A
Potential Funding Sources:	HMGP or PDM with local or State match
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate
2015 Status:	Partially Completed/In Progress
Narrative Explanation:	Continuing to search out mitigation opportunities: streambed restoration and property buy-outs.

7.2 New 2015 Mitigation Actions

This subsection contains the new mitigation actions for the City of Durham for the 2015-2020 planning cycle. These actions are in addition to any actions that are ongoing from the previous list of mitigation items.

Mitigation Action 1	Identify and obtain additional properties to increase protected open space as a land-use tool to reduce adverse impacts from floods.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	Flood
Lead Agency/Department Responsible:	City-County Planning Department
Estimated Cost:	N/A
Potential Funding Sources:	HMGP or PDM with local or State match
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 2	Seek funding to retrofit critical facilities and City-owned facilities for improved resilience to all hazards with the use of the latest building materials and technology. This could include, but is not limited to: wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, 320 or 361 compliant safe rooms, lightning protection, hail resistant roofing, and anchoring fixed building equipment.
Goal:	#4
Category:	Structure and Infrastructure Projects
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Buildings and Inspections Department; Planning Department; Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local, State Grants, UHMA Grants, other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Mitigation Action 3	Seek funding to install backup generators or quick connect hook ups for mobile generators on any newly constructed City critical facilities.
Goal:	#4
Category:	Other Types of Actions
Hazard(s) Addressed:	All
Lead Agency/Department Responsible:	Buildings and Inspections Department; Planning Department; Emergency Services
Estimated Cost:	To be determined on a case-by-case basis
Potential Funding Sources:	Local, State Grants, UHMA Grants, other federal grants
Implementation Schedule:	2015-2020
Priority (High, Moderate, Low):	Moderate

Section 8: Plan Maintenance Procedures

The *Plan Maintenance Procedures* section discusses how the *Mitigation Strategy* and *Mitigation Action Plans* will be implemented by participating jurisdictions and how the overall Regional Hazard Mitigation Plan will be evaluated and enhanced over time. This section also discusses how the public will continue to be involved in the hazard mitigation planning process. It consists of the following three subsections:

- 8.1 Implementation
- 8.2 Monitoring, Evaluation, and Enhancement
- 8.3 Continued Public Involvement

8.1 Implementation

Each jurisdiction participating in this Plan is responsible for implementing specific mitigation actions as prescribed in their locally adopted *Mitigation Action Plan* (Section 7). In each *Mitigation Action Plan*, every proposed action is assigned to a specific local department or agency in order to assign responsibility and accountability and increase the likelihood of subsequent implementation. This approach enables individual jurisdictions to update their own unique mitigation action list as needed without altering the broader focus of the regional Plan. The separate adoption of locally specific actions also ensures that each jurisdiction is not held responsible for the monitoring and implementation of actions belonging to other jurisdictions involved in the planning process.

In addition to the assignment of a local lead department or agency, an implementation time period or a specific implementation date or window has been assigned to each mitigation action to help assess whether actions are being implemented in a timely fashion. The jurisdictions present within the Eno-Haw Region will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments. When applicable, potential funding sources have been identified for proposed actions listed in the *Mitigation Action Plans*.

It will be the responsibility of each participating jurisdiction to determine additional implementation procedures beyond those listed within their *Mitigation Action Plan*. This includes integrating the requirements of the Regional Hazard Mitigation Plan into other local planning documents, processes, or mechanisms such as comprehensive or capital improvement plans, when appropriate. The members of the Hazard Mitigation Planning Team (HMPT) will remain charged with ensuring that the goals and strategies of new and updated local planning documents for their jurisdictions or agencies are consistent with the goals and actions of the Regional Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability in the Eno-Haw Region. Opportunities to integrate the requirements of this Plan into other local planning mechanisms shall continue to be identified through future meetings of the HMPT and through the five-year review process described herein. Although it is recognized that there are many possible benefits to integrating components of this Plan into other local planning mechanisms, the development and maintenance of this stand-alone Regional Hazard Mitigation Plan is deemed by the HMPT to be the most effective and appropriate method to implement local hazard mitigation actions at this time.

8.2 Monitoring, Evaluation, and Enhancement

The agency with the overall responsibility for monitoring this Plan is Orange County Emergency Services. Periodic revisions and updates of the Regional Hazard Mitigation Plan are required to ensure that the goals of the Plan are kept current, taking into account potential changes in hazard vulnerability and mitigation priorities. In addition, revisions may be necessary to ensure that the Plan is in full compliance with applicable federal and state regulations. Periodic evaluation of the Plan will also ensure that specific mitigation actions are being reviewed and carried out according to each jurisdiction's individual *Mitigation Action Plan*.

The Eno-Haw HMPT will continue to meet regularly, as determined by Orange County Emergency Services. These regular meetings will take place in the fall of each year so that sufficient time is available to prepare public outreach messages and assess the status of any mitigation actions relevant to the upcoming severe seasonal spring weather and the start of hurricane season. Meetings will also be convened as necessary following any disaster events warranting a reexamination of the mitigation actions being implemented or proposed by the participating jurisdictions.

County and local staff of each participating jurisdiction will also continue to attend training workshops sponsored by the North Carolina Division of Emergency Management or others as appropriate in order to keep up-to-date with any changing guidance or planning requirements and to communicate that information to other representatives of participating jurisdictions.

As part of this monitoring, evaluation, and enhancement process, each participating jurisdiction will be expected to provide an annual status update to Orange County for their respective *Mitigation Action Plans* in order to evaluate the Plan's implementation effectiveness. This will ensure that the Plan is continuously maintained and updated to reflect changing conditions and needs within the Eno-Haw Region. If determined appropriate or as requested, an annual report on the Plan will be developed and presented to local governing bodies of participating jurisdictions in order to report progress on the actions identified in the Plan and to provide information on the latest legislative requirements and/or changes to those requirements.

The monitoring, evaluation, and enhancement processes contained in the hazard mitigation plans previously adopted by the jurisdictions in the planning area were summarized, reviewed, and assessed as part of the 2015 plan update. The findings of this assessment are as follows.

With regard to the plan maintenance procedures adopted in the previous county level plans, the following comments were documented by the 2015 Hazard Mitigation Planning Team and incorporated into the new plan maintenance procedures for the 2015-2020 planning period:

Alamance County

- Not enough meetings were held to implement the plan and evaluate its effectiveness during the 2010-2015 planning period due to staffing. No major projects were implemented under the 2010 Hazard Mitigation Plan.
- No report was made to the Commissioners or municipalities during the 2010-2015 planning period due to staffing.
- No annual progress reports were submitted, primarily because no major projects were implemented under the 2010 Hazard Mitigation Plan.

- The County was not made aware of any jurisdictional updates, primarily because no major projects were implemented under the 2010 Hazard Mitigation Plan.
- No significant natural hazard events occurred from 2010-2015 that required any updates to the plan prior to the scheduled five-year plan update. The County has participated in the 2015 update as part of the Eno-Haw Regional Hazard Mitigation Plan planning process.

Orange County

- Team members indicated that some elements of the previous plan maintenance procedures could have been completed in a more systematic and thorough approach. Efforts will be made to rectify this for the 2015-2020 planning period.
- Team members from some jurisdictions indicated that they were not aware of plans for an annual meeting. This could be due in part to staff turnover. Communication regarding annual meetings will be better publicized for the 2015-2020 planning period.
- The process for soliciting comments from the general public worked well. The plan was posted and made available throughout the last five year period (2010-2015). This will be continued for the 2015-2020 planning period.

Durham County

- Overall coordination of the plan maintenance procedures worked well.
- The annual requirements were somewhat difficult because of the collaboration required. The annual plan review is also required for the City and County CRS programs. CRS managers have been involved in the annual review process. Efforts will be made to streamline communications between hazard mitigation planning and CRS to optimize activities and reduce duplication of effort.
- Annual meetings with the public are always advertised but poorly attended. Strategies for greater participation are being evaluated.

Five (5) Year Plan Review

The Plan will be reviewed by the HMPT every five years to determine whether there have been any significant changes in the Eno-Haw Region that may, in turn, necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, increased exposure to hazards, an increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the necessary content of the Plan.

The plan review provides community officials with an opportunity to evaluate those actions that have been successful and to explore the possibility of documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned. Orange County Emergency Services will be responsible for reconvening the HMPT and conducting the five-year review.

During the five-year plan review process, the following questions will be considered as criteria for assessing the effectiveness and appropriateness of the Plan:

- Do the goals address current and expected conditions?
- Has the nature or magnitude of risks changed?
- Are the current resources appropriate for implementing the Plan?
- Are there implementation problems, such as technical, political, legal, or coordination issues with other agencies?
- Have the outcomes occurred as expected?
- Did the jurisdictions, agencies, and other partners participate in the plan implementation process as proposed?

Following the five-year review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures outlined herein. Upon completion of the review and update/amendment process, the Eno-Haw Regional Hazard Mitigation Plan will be submitted to the State Hazard Mitigation Officer at the North Carolina Division of Emergency Management for final review and approval in coordination with the Federal Emergency Management Agency.

Disaster Declaration

Following a disaster declaration, the Plan will be revised as necessary to reflect lessons learned, or to address specific issues and circumstances arising from the event. It will be the responsibility of Orange County Emergency Services to reconvene the HMPT and ensure the appropriate stakeholders are invited to participate in the plan revision and update process following declared disaster events.

Reporting Procedures

The results of the five-year review will be summarized by the HMPT in the relevant sections of the updated plan. This includes: a comprehensive description of the plan update process including an evaluation of plan effectiveness (Section 2); any updates to the planning area profile (Section 3); any notable revisions or updates to the risk assessment (Section 4) or capability assessment (Section 5); updated mitigation goals and consideration of mitigation action alternatives (Section 6); status updates on previously adopted mitigation action plans (including the identification of reasons for delays or obstacles to their implementation) as well as the identification of newly proposed mitigation actions (Section 7); and revisions or updates to plan maintenance procedures (Section 8).

Any necessary revisions or changes to the countywide Plan elements must follow the monitoring, evaluation, and enhancement procedures outlined herein. For changes and updates to the individual *Mitigation Action Plans*, appropriate local designees will assign responsibility for the completion of the task.

8.3 Continued Public Involvement

Public participation is an integral component of the mitigation planning process and will continue to be essential as this Plan evolves and is updated over time.

The most appropriate and meaningful opportunities for the general public to be involved in the maintenance and implementation of the Eno-Haw Regional Hazard Mitigation Plan is during the five-year plan review process as described earlier in this section. As demonstrated in Section 2: *Planning Process*, the participating jurisdictions of the Eno-Haw Region have been diligent and successful in gaining widespread public involvement during the five-year plan review process through multiple methods. While the five-year plan review process represents the greatest opportunity for such involvement, other efforts to involve the public in the maintenance, evaluation, and revision process will continue to be made as necessary. These efforts may include:

- Advertising meetings of the HMPT in local newspapers, public bulletin boards, and/or City and County office buildings;
- Designating willing and voluntary citizens and private sector representatives as official members of the HMPT;
- Working with children through school programs and other appropriate venues in an effort to engage parents and other adults;
- Utilizing local media to update the public of any maintenance and/or periodic review activities taking place;
- Utilizing City and County websites to advertise any maintenance and/or periodic review activities taking place;
- Keeping copies of the Plan in public libraries; and
- Posting any Annual Reports on the Plan to City and County websites.

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Appendix A: Plan Adoption

This appendix to the Eno-Haw Regional Hazard Mitigation Plan includes copies of the local resolutions passed by each participating jurisdiction requesting approval of the Plan. The jurisdictions are listed below in the order that the plan adoption resolutions are included in this appendix.

- **Alamance County**
- Village of Alamance
- City of Burlington
- Town of Elon
- City of Graham
- Town of Green Level
- Town of Haw River
- City of Mebane
- Town of Ossipee
- Town of Swepsonville
- **Orange County**
- Town of Carrboro
- Town of Chapel Hill
- Town of Hillsborough
- **Durham County**
- City of Durham

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ORANGE COUNTY BOARD OF COMMISSIONERS

RESOLUTION OF ADOPTION ENO-HAW REGIONAL HAZARD MITIGATION PLAN

WHEREAS, in October 2000, the President of the United States signed into law the “Disaster Mitigation Act of 2000” (PL 106-390) to amend the “Robert T. Stafford Disaster Relief and Emergency Act of 1988” which requires local governments to adopt a mitigation plan in order to be eligible for hazard mitigation funding; and

WHEREAS, Federal mitigation planning regulations require local mitigation plans to be updated and resubmitted to the Federal Emergency Management Agency for approval every five years in order to continue eligibility for Federal Emergency Management Agency hazard mitigation assistance programs; and

WHEREAS, North Carolina General Statute §166-A - 19.41, approved by the North Carolina General Assembly in June 2001 requires local governments to have a hazard mitigation plan approved in order to receive state public assistance funds; and

WHEREAS, County staff along with representatives from partnering jurisdictions in conjunction with contract services have performed a comprehensive review and evaluation of the newly created Eno-Haw Regional Hazard Mitigation Plan and have updated the plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the North Carolina Division of Emergency Management; and

WHEREAS, the North Carolina Division of Emergency Management has deemed the Eno-Haw Regional Hazard Mitigation Plan compliant with Section 322 of the Disaster Mitigation Act of 2000, as well as with relevant state requirements; and

WHEREAS, the Federal Emergency Management Agency has received a draft of the Eno-Haw Regional Hazard Mitigation Plan and is currently reviewing;

NOW THEREFORE, BE IT RESOLVED, that the Board of County Commissioners of Orange County hereby adopt, by way of this resolution, the “Eno-Haw Regional Hazard Mitigation Plan” as approved by the North Carolina Division of Emergency Management.

This the 16th day of June, 2015.

Earl McKee, Chair
Orange County Board of Commissioners

ATTEST:

COUNTY SEAL

Donna Baker
Clerk to the Board

Appendix B: *Local Mitigation Plan Review Tool*

This appendix to the Eno-Haw Regional Hazard Mitigation Plan contains a copy of a completed *Local Mitigation Plan Review Tool*. This checklist provides page numbers indicating where in the Plan each element required by FEMA is met. This serves as a final internal review to confirm that the Plan meets Federal requirements.

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LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdictions: Alamance, Orange, and Durham Counties and incorporated municipalities	Title of Plan: Eno-Haw Regional Hazard Mitigation Plan	Date of Plan: April 2015
Local Point of Contact: Kirby Saunders	Address: 510 Meadowlands Drive PO Box 8181 Hillsborough, NC 27278	
Title: Orange County Emergency Management Coordinator		
Agency: Orange County Emergency Services		
Phone Number: (919) 245-6135	E-Mail: ksaunders@orangecountync.gov	

State Reviewer:	Title:	Date:
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FEMA Reviewer:	Title:	Date:
Date Received in FEMA Region <i>(insert #)</i>		
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

SECTION 1: REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section 2: Planning Process			
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Section 2 throughout and specifically Sections 2.6 and 2.7.			
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section 2.6			
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Sections 2.2 and 2.3			
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section 8.3			
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Section 8: Plan Maintenance Procedures			
ELEMENT A: REQUIRED REVISIONS				

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 4: Risk Assessment, specifically Section 4.5			
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section 4.5			
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Sections 4.5 and 4.6			
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Section 4.5			
<u>ELEMENT B: REQUIRED REVISIONS</u>				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Section 5: Capability Assessment			
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section 5, specifically Sections 5.3.1 and 5.3.1.3			
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 6: Mitigation Strategy			
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Section 7: Mitigation Action Plans			
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Section 7: Mitigation Action Plans			
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section 8.1			
<u>ELEMENT C: REQUIRED REVISIONS</u>				

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Section 4: Risk Assessment (as described in Section 4, specifically in Section 4.2, the latest GIS data available was used to determine vulnerabilities to existing development beyond what was addressed in previous plan updates)			
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section 7 (the Mitigation Action Plan for each jurisdiction includes an update on previously adopted actions)			
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 7 (the Mitigation Action Plan for each jurisdiction includes an update on previously adopted actions, including changes in priorities)			
ELEMENT D: REQUIRED REVISIONS				
ELEMENT E. PLAN ADOPTION				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	This will be included in Appendix A			
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	This will be included in Appendix A			
ELEMENT E: REQUIRED REVISIONS				

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)				
F1.				
F2.				
<u>ELEMENT F: REQUIRED REVISIONS</u>				

SECTION 2: PLAN ASSESSMENT

INSTRUCTIONS: The purpose of the Plan Assessment is to offer the local community more comprehensive feedback to the community on the quality and utility of the plan in a narrative format. The audience for the Plan Assessment is not only the plan developer/local community planner, but also elected officials, local departments and agencies, and others involved in implementing the Local Mitigation Plan. The Plan Assessment must be completed by FEMA. The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the Plan; 2) specific sections in the Plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically RiskMAP and Hazard Mitigation Assistance programs. The Plan Assessment is divided into two sections:

1. Plan Strengths and Opportunities for Improvement
2. Resources for Implementing Your Approved Plan

Plan Strengths and Opportunities for Improvement is organized according to the plan Elements listed in the Regulation Checklist. Each Element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item, and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each Element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature, and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the Plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

Resources for Implementing Your Approved Plan provides a place for FEMA to offer information, data sources and general suggestions on the overall plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

How does the Plan go above and beyond minimum requirements to document the planning process with respect to:

- *Involvement of stakeholders (elected officials/decision makers, plan implementers, business owners, academic institutions, utility companies, water/sanitation districts, etc.);*
- *Involvement of Planning, Emergency Management, Public Works Departments or other planning agencies (i.e., regional planning councils);*
- *Diverse methods of participation (meetings, surveys, online, etc.); and*
- *Reflective of an open and inclusive public involvement process.*

Element B: Hazard Identification and Risk Assessment

In addition to the requirements listed in the Regulation Checklist, 44 CFR 201.6 Local Mitigation Plans identifies additional elements that should be included as part of a plan's risk assessment. The plan should describe vulnerability in terms of:

- 1) *A general description of land uses and future development trends within the community so that mitigation options can be considered in future land use decisions;*
- 2) *The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; and*
- 3) *A description of potential dollar losses to vulnerable structures, and a description of the methodology used to prepare the estimate.*

How does the Plan go above and beyond minimum requirements to document the Hazard Identification and Risk Assessment with respect to:

- *Use of best available data (flood maps, HAZUS, flood studies) to describe significant hazards;*
- *Communication of risk on people, property, and infrastructure to the public (through tables, charts, maps, photos, etc.);*
- *Incorporation of techniques and methodologies to estimate dollar losses to vulnerable structures;*
- *Incorporation of Risk MAP products (i.e., depth grids, Flood Risk Report, Changes Since Last FIRM, Areas of Mitigation Interest, etc.); and*
- *Identification of any data gaps that can be filled as new data became available.*

Element C: Mitigation Strategy

How does the Plan go above and beyond minimum requirements to document the Mitigation Strategy with respect to:

- *Key problems identified in, and linkages to, the vulnerability assessment;*
- *Serving as a blueprint for reducing potential losses identified in the Hazard Identification and Risk Assessment;*
- *Plan content flow from the risk assessment (problem identification) to goal setting to mitigation action development;*
- *An understanding of mitigation principles (diversity of actions that include structural projects, preventative measures, outreach activities, property protection measures, post-disaster actions, etc);*
- *Specific mitigation actions for each participating jurisdictions that reflects their unique risks and capabilities;*
- *Integration of mitigation actions with existing local authorities, policies, programs, and resources; and*
- *Discussion of existing programs (including the NFIP), plans, and policies that could be used to implement mitigation, as well as document past projects.*

Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

How does the Plan go above and beyond minimum requirements to document the 5-year Evaluation and Implementation measures with respect to:

- *Status of previously recommended mitigation actions;*
- *Identification of barriers or obstacles to successful implementation or completion of mitigation actions, along with possible solutions for overcoming risk;*
- *Documentation of annual reviews and committee involvement;*
- *Identification of a lead person to take ownership of, and champion the Plan;*
- *Reducing risks from natural hazards and serving as a guide for decisions makers as they commit resources to reducing the effects of natural hazards;*
- *An approach to evaluating future conditions (i.e. socio-economic, environmental, demographic, change in built environment etc.);*
- *Discussion of how changing conditions and opportunities could impact community resilience in the long term; and*
- *Discussion of how the mitigation goals and actions support the long-term community vision for increased resilience.*

B. Resources for Implementing Your Approved Plan

Ideas may be offered on moving the mitigation plan forward and continuing the relationship with key mitigation stakeholders such as the following:

- *What FEMA assistance (funding) programs are available (for example, Hazard Mitigation Assistance (HMA)) to the jurisdiction(s) to assist with implementing the mitigation actions?*
- *What other Federal programs (National Flood Insurance Program (NFIP), Community Rating System (CRS), Risk MAP, etc.) may provide assistance for mitigation activities?*
- *What publications, technical guidance or other resources are available to the jurisdiction(s) relevant to the identified mitigation actions?*
- *Are there upcoming trainings/workshops (Benefit-Cost Analysis (BCA), HMA, etc.) to assist the jurisdictions(s)?*
- *What mitigation actions can be funded by other Federal agencies (for example, U.S. Forest Service, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA) Smart Growth, Housing and Urban Development (HUD) Sustainable Communities, etc.) and/or state and local agencies?*

SECTION 3:
MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were ‘Met’ or ‘Not Met,’ and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

MULTI-JURISDICTION SUMMARY SHEET												
#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Require- ments
1	Alamance	County	Alva Sizemore		alva.sizemore@alamance-nc.com	336-227-1365						
2	Alamance	Village	Ben York		village.alamance@bellsouth.net	336-226-0033						
3	Burlington	City	Roger Manuel		rmanuel@ci.burlington.nc.us	336-516-4674						

MULTI-JURISDICTION SUMMARY SHEET												
#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Require- ments
4	Elon	Town	Sean Tencer		stencer@ci.elon.nc.us	336-584-2859						
5	Graham	City	Melissa Guilbeau		mguilbeau@cityofgraham.com	336-570-6705						
6	Green Level	Town	Quentin McPhatter			336-578-3443						
7	Haw River	Town	Jeff Earp		jearp@townofhawriver.com	336-578-0010						
8	Mebane	City	David Cheek		dccheek@cityofmebane.com	336-584-0526						
9	Ossipee	Town	Richard Overman		rovermanos@bell-south.net	336-584-8555						
10	Sweptsonville	Town	Raymond Herring			336-578-1500						

MULTI-JURISDICTION SUMMARY SHEET												
#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Require- ments
11	Orange	County (Lead)	Josh Hollingsworth		jhollingsworth@orangecounty.nc.gov	919-245-6100						
12	Carrboro	Town	Travis Crabtree		tcrabtree@townofcarrboro.org	919-918-7327						
13	Chapel Hill	Town	Matt Sullivan		MSULLIVAN@townofchapelhill.org	919-968-2814						
14	Hillsborough	Town	Jerry Wagner		Jerry.Wagner@hillsboroughnc.org	919-241-4801						
15	Durham	County	Mark Schell		mschell@dcov.gov	919-560-0663						
16	Durham	City	Mark Schell		mschell@dcov.gov	919-560-0663						

Appendix C: Public Outreach Strategy

This appendix to the Eno-Haw Regional Hazard Mitigation Plan contains a copy of the Public Outreach Strategy finalized on September 15, 2014 to guide the public outreach element of the mitigation planning process.

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Eno-Haw Regional Hazard Mitigation Plan

Public Outreach Strategy

September 15, 2014

Project Summary

The counties of Alamance, Durham, and Orange, in coordination with their participating municipal jurisdictions, are preparing a regional hazard mitigation plan that will cover the three-county “Eno-Haw” area. The Eno-Haw Regional Hazard Mitigation Plan will identify local policies and actions for reducing risk and future losses from natural hazards such as floods, severe storms, wildfires, and winter weather. It will build upon the separate hazard mitigation plans that were initially prepared by each county in coordination with their municipalities, as well as the Town of Chapel Hill’s own stand-alone plan.

The plan will also serve to meet key federal planning regulations which require local governments to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation projects. These mitigation planning requirements stem from the Disaster Mitigation Act of 2000, which was passed by the U.S. Congress in October of 2000. This Act amended federal law to require that all states and local governments must have hazard mitigation plans in place in order to be eligible to apply for funding under such programs as the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) program.

Public Outreach

A key element in the mitigation planning process is the discussion it promotes among community members about creating a safer, more disaster-resilient community. A plan that accurately reflects the community’s values and priorities is likely to have greater legitimacy and “buy-in” and greater success in implementing mitigation actions and projects to reduce risk.¹ Therefore, the purpose of the Eno-Haw Regional Hazard Mitigation Plan Public Outreach Strategy is to:

- Generate public interest;
- Solicit citizen input; and
- Engage additional partners in the planning process.

The following specific public outreach opportunities and methods have been identified for citizens and targeted stakeholders to participate at various points in the mitigation planning process, and are presented in more detail on the following pages:

1. In-person public meetings (2)
2. Public information website (including social media integration, where possible)
3. Project information fact sheet
4. Planning resources
5. Public participation survey

¹ FEMA, *Local Mitigation Planning Handbook*, March 2013.

OUTREACH METHOD 1
In-Person Public Meetings (2)
AVAILABILITY
December 4, 2014 and April 30, 2015.
BRIEF DESCRIPTION
Two public meetings will be scheduled at key points in the project timeline, one following completion of the draft risk and capability assessments and one following completion of the draft plan (and prior to the plan's local adoption). These meetings will be coordinated and arranged by Orange County with facilitation support from AECOM.
DETAILS
<p>For both public meetings:</p> <ul style="list-style-type: none"> • The purpose will be to inform the public on the process and current status of the regional planning process, as well as gain input to the process during the drafting stage and prior to plan completion and approval • AECOM will prepare presentation and handout materials to help facilitate two-way communication with public meeting attendees
LEAD AGENCY
Orange County/AECOM

OUTREACH METHOD 2
Public Information Website (including Social Media Integration)
AVAILABILITY
Throughout the planning cycle.
BRIEF DESCRIPTION
A project information website will be hosted by Orange County Emergency Services and will be available to the general public and to members of the Hazard Mitigation Planning Team for the duration of the project at the following web address: http://www.co.orange.nc.us/emergency/Eno-HawRHMP.asp . The primary purpose of this site will be to share information relevant to the 2015 Eno-Haw Regional Hazard Mitigation Plan planning process.
DETAILS
<p>Specific resources to be included on this site include:</p> <ul style="list-style-type: none"> • Project information fact sheet • Drafts of Eno-Haw Regional Hazard Mitigation Plan sections • List of Eno-Haw Local Jurisdiction Leads • List of project tasks and subtasks with schedule • PowerPoint files from Hazard Mitigation Planning Team meetings • PDFs of existing local hazard mitigation plans for reference during the plan update process • Links to planning resources, including recently published FEMA hazard mitigation planning guidance • Social media integration including, but not limited to, Facebook, Twitter, Tumblr, Pinterest, and others
LEAD AGENCY
Orange County

OUTREACH METHOD 3	
Project Information Fact Sheet	
AVAILABILITY	
September 15, 2014	
BRIEF DESCRIPTION	
A 1-page (double-sided) project information fact sheet will be available online in PDF format for the duration of the project. The primary purpose of this document will be to provide information on the regional planning process and to provide project contact information and links for interested parties to engage in the planning effort. This resource will be available on the project information website described above in Outreach Method 3. Printed copies may be made available on an as-needed basis.	
DETAILS	
<p>Specific information to be provided in this fact sheet includes:</p> <ul style="list-style-type: none"> • Project overview • Overview of the regional hazard mitigation planning process, including: <ul style="list-style-type: none"> ○ Public outreach ○ Risk assessment ○ Capability assessment ○ Mitigation strategy development ○ Plan maintenance ○ Plan adoption • Explanation of project leadership • Project schedule • Contact information and links to project information website • Project graphics/illustrations 	
LEAD AGENCY	
Orange County/AECOM	

OUTREACH METHOD 4	
Planning Resources	
AVAILABILITY	
September 15, 2014	
BRIEF DESCRIPTION	
Mitigation planning resources will be made available for Hazard Mitigation Planning Team members and other interested parties in order to promote education and participation in the mitigation planning process.	
DETAILS	
<p>Specific planning resources will include:</p> <ul style="list-style-type: none"> • FEMA mitigation planning guidance <ul style="list-style-type: none"> ○ <i>Local Mitigation Planning Handbook</i> ○ <i>Mitigation Ideas</i> ○ <i>Integrating Hazard Mitigation Into Local Planning</i> • Other appropriate planning resources as identified throughout the duration of the planning process 	
LEAD AGENCY	
Orange County/AECOM	

OUTREACH METHOD 5
Public Participation Survey
AVAILABILITY
September 30, 2014 through December 31, 2014
BRIEF DESCRIPTION
<p>An online public participation survey will be hosted by AECOM using the SurveyMonkey web hosting service and will be open to the public for a duration of three months. The primary purpose of this survey will be to solicit input from any interested parties in the planning area and will be used so that individuals throughout the planning area have the opportunity to provide valuable information and feedback to the project team. The online survey will give individuals that are unable to attend the in-person meetings the opportunity to participate in the plan update process. Information from the online survey will allow the project team to better understand the types of hazards that most concern the public and the mitigation actions that are of particular interest. The survey will be made accessible through hyperlinks posted on the project information website and can be circulated via email, Facebook, etc. Additionally, hard copies of the survey will be distributed at the in-person public meetings. The feedback received will be evaluated and incorporated into the Hazard Mitigation Planning Team's decision making process and the final plan.</p>
DETAILS
<p>Types of specific questions to be asked as part of this survey include:</p> <ul style="list-style-type: none"> • Personal history with natural hazards • Natural hazard concerns • Perception of vulnerable community assets • Importance of community assets • Priorities concerning natural hazard preparedness • Steps local government can take to reduce natural hazard risk • Types of mitigation activities deemed important • Personal interest in natural hazard mitigation • Effective ways to communicate with residents • Location in the floodplain • Questions regarding flood insurance • Personal actions to mitigate property • Mitigation activities planned for the respondent's household • Location within the planning area • Age (optional)* • Gender (optional)* • Highest level of education (optional)* • Length of time living in the planning area • Ownership of property versus rental status • Type of dwelling • Open comments** <p><i>* All information will be kept strictly confidential</i></p> <p><i>** Information will be processed and summarized by AECOM in order to produce summary statistics and summary responses</i></p>
LEAD AGENCY
Orange County/AECOM

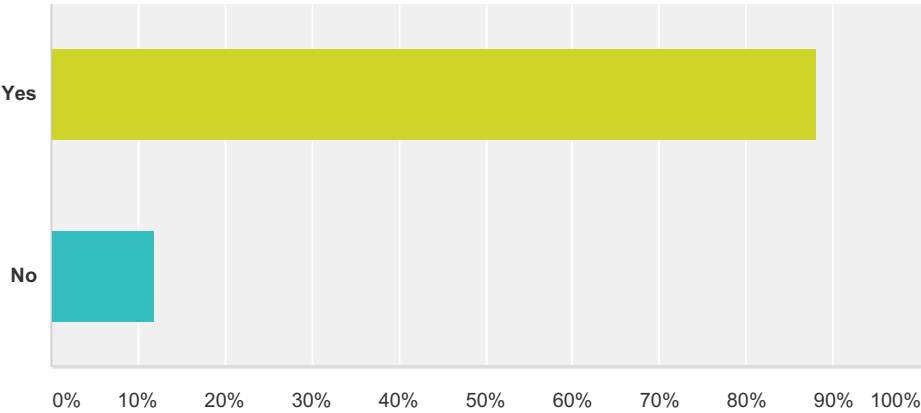
Appendix D: Public Participation Survey

This appendix to the Eno-Haw Regional Hazard Mitigation Plan contains a summary of the results obtained through the public participation survey offered from September 30 through December 31, 2014. The survey was conducted online through SurveyMonkey, an online survey software provider, and was also made available in print form at public meetings and at other locations throughout the planning area. No written responses were submitted.

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Q1 Have you ever experienced or been impacted by a disaster?

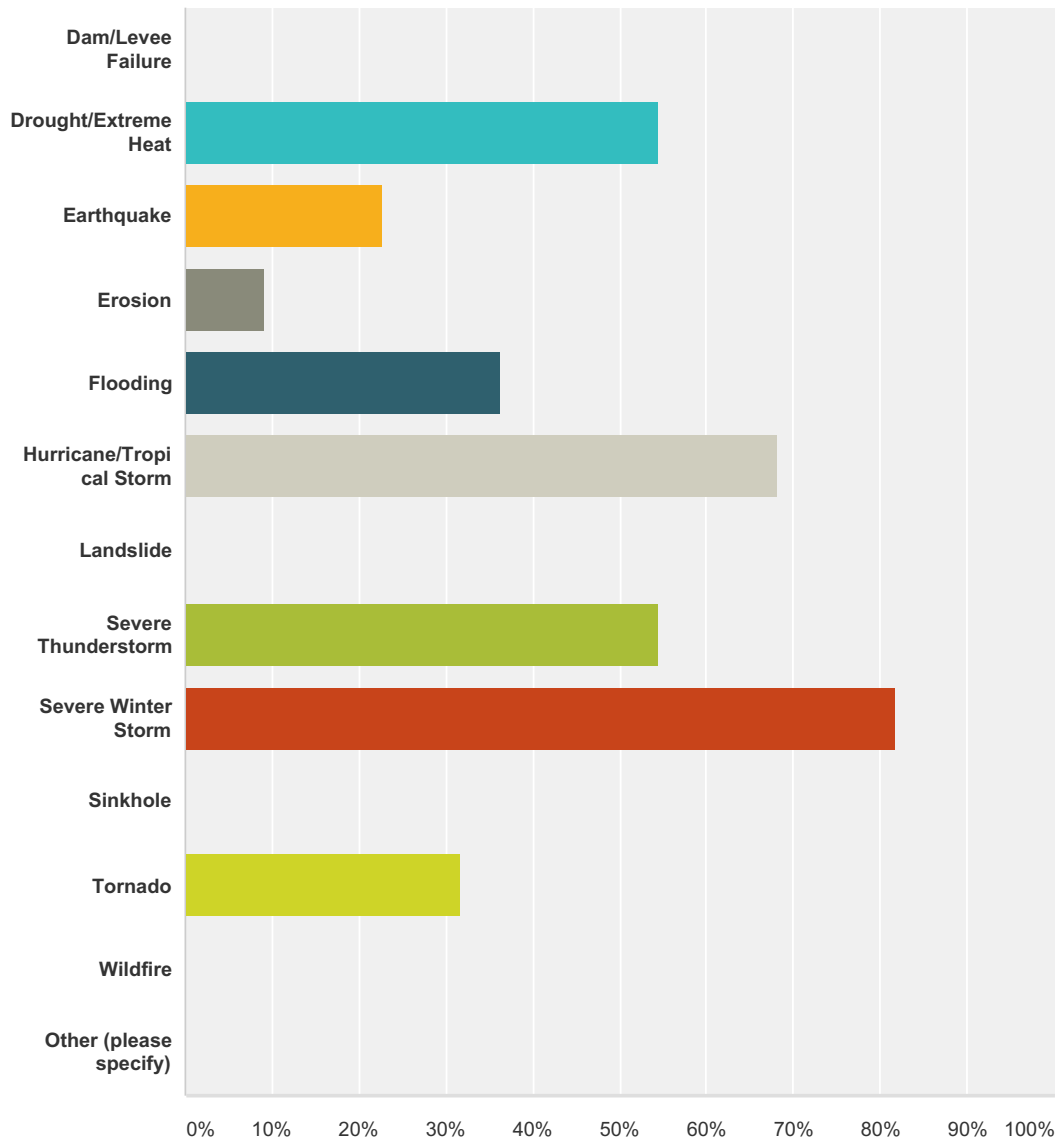
Answered: 25 Skipped: 0



Answer Choices	Responses	
Yes	88.00%	22
No	12.00%	3
Total		25

Q2 If yes, which of these natural hazards have you experienced or been impacted by? (Check all that apply.)

Answered: 22 Skipped: 3



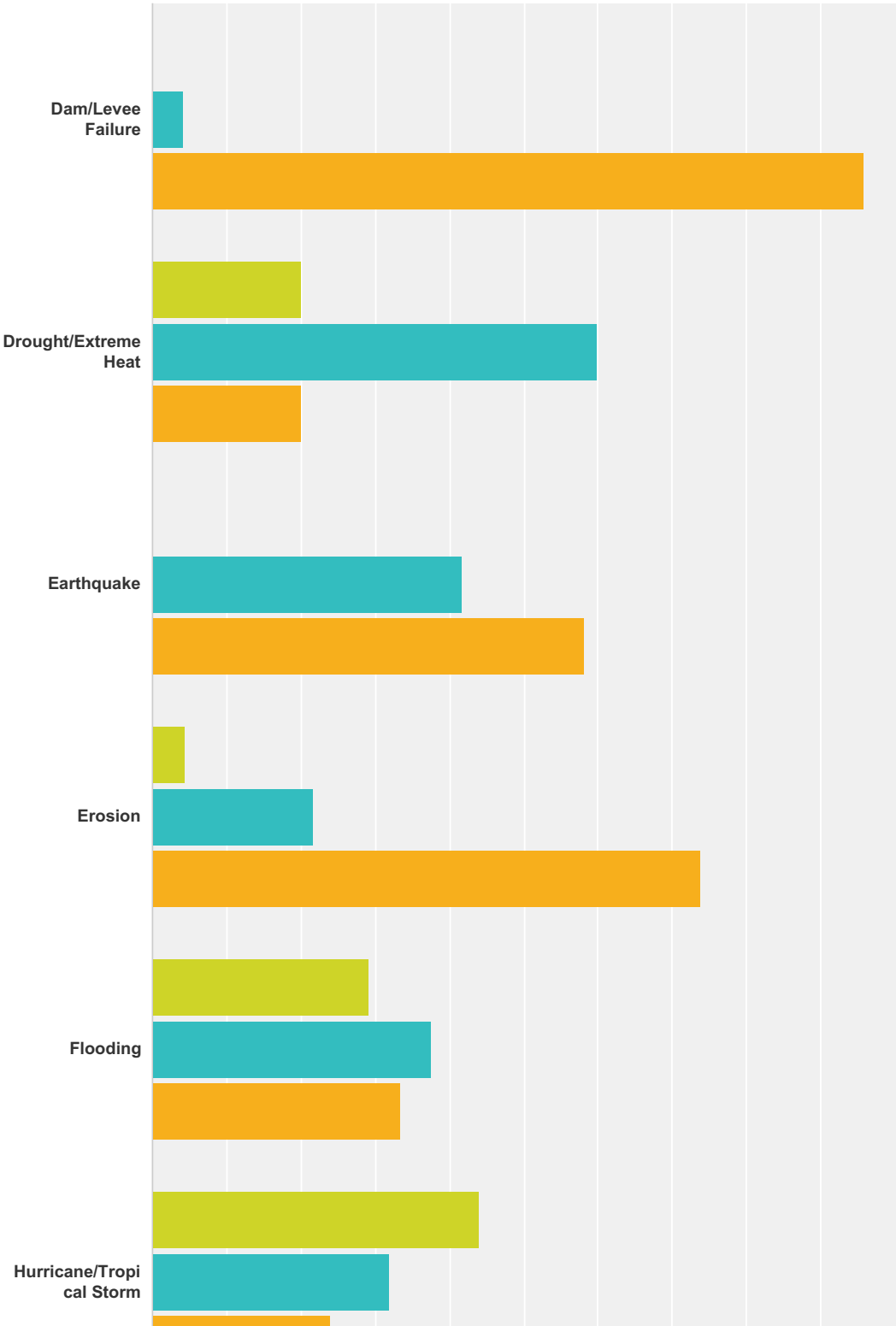
Answer Choices	Responses
Dam/Levee Failure	0.00% 0
Drought/Extreme Heat	54.55% 12
Earthquake	22.73% 5
Erosion	9.09% 2
Flooding	36.36% 8
Hurricane/Tropical Storm	68.18% 15

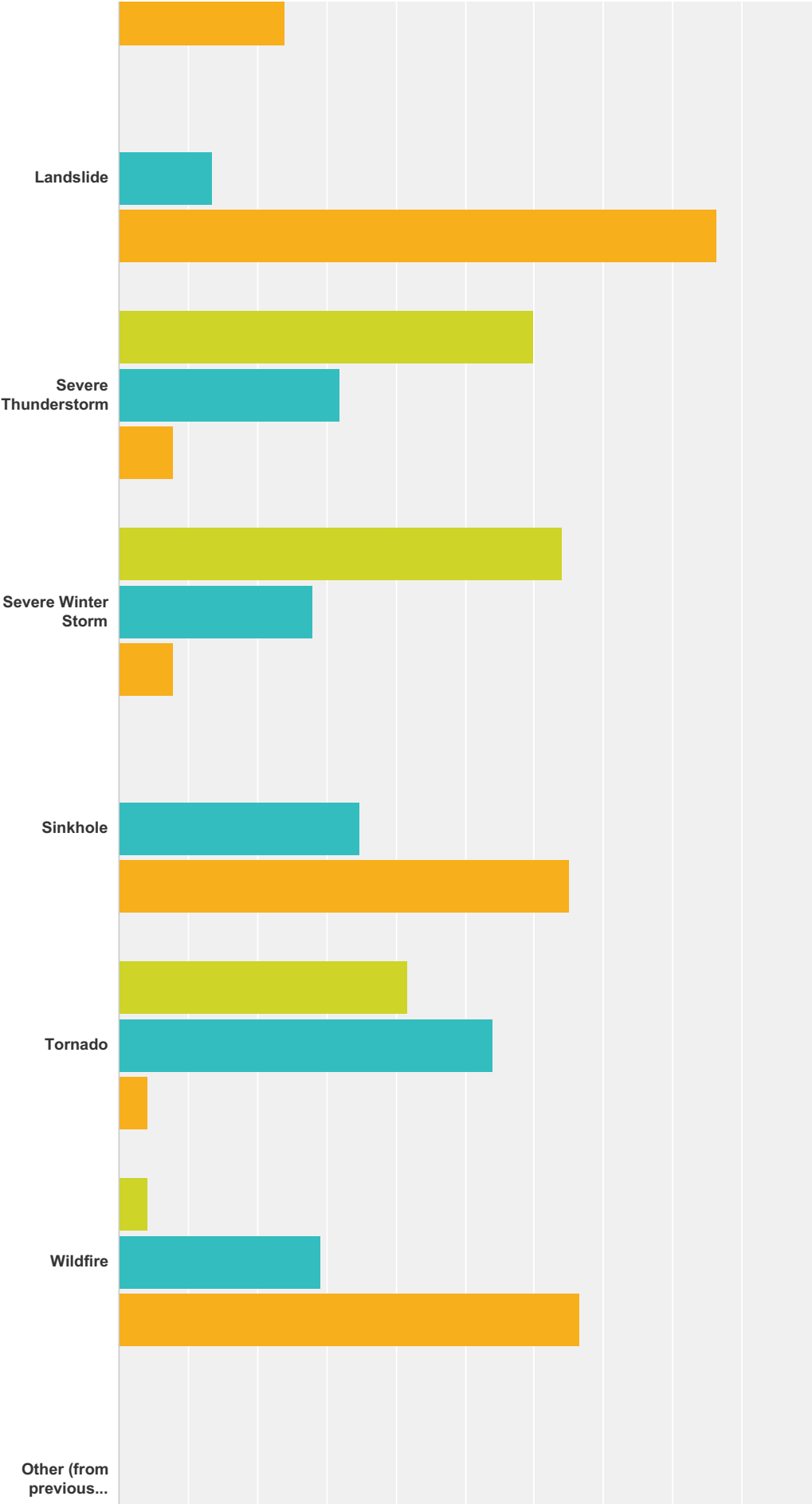
Landslide	0.00%	0
Severe Thunderstorm	54.55%	12
Severe Winter Storm	81.82%	18
Sinkhole	0.00%	0
Tornado	31.82%	7
Wildfire	0.00%	0
Other (please specify)	0.00%	0
Total Respondents: 22		

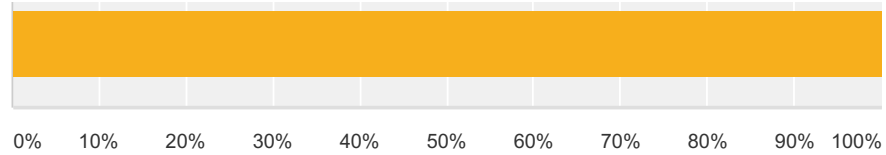
#	Other (please specify)	Date
	There are no responses.	

Q3 How concerned are you about the possibility of your community being impacted by each of these natural hazards? (Check the corresponding circle for each natural hazard.)

Answered: 25 Skipped: 0





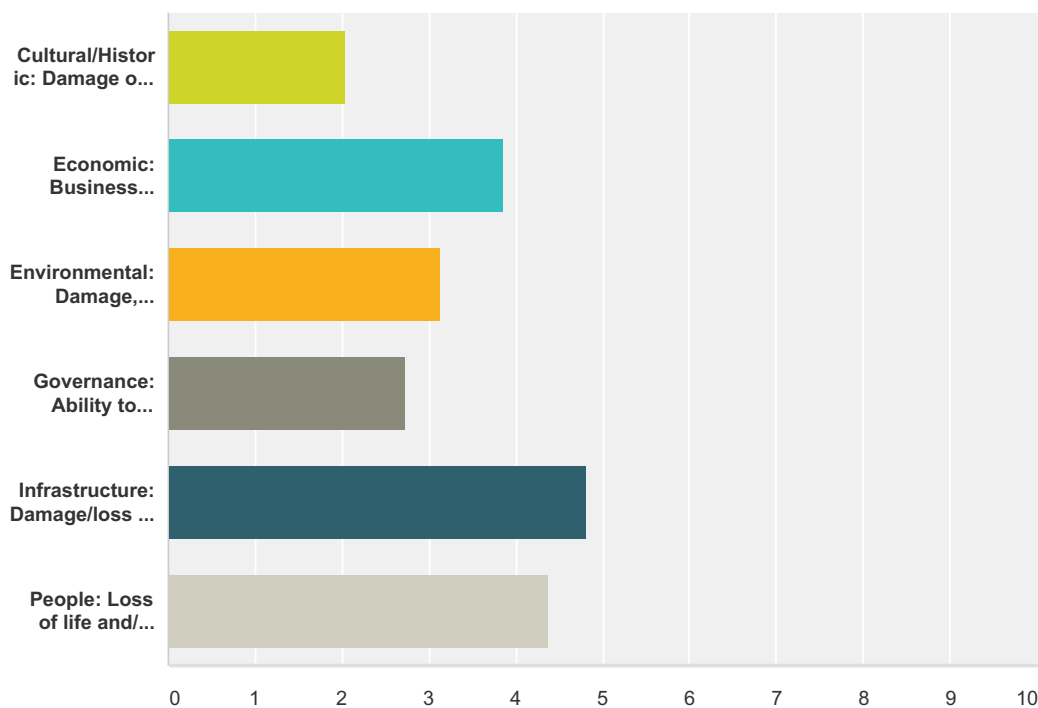


■ Very Concerned
 ■ Somewhat Concerned
 ■ Not Concerned

	Very Concerned	Somewhat Concerned	Not Concerned	Total
Dam/Levee Failure	0.00% 0	4.17% 1	95.83% 23	24
Drought/Extreme Heat	20.00% 5	60.00% 15	20.00% 5	25
Earthquake	0.00% 0	41.67% 10	58.33% 14	24
Erosion	4.35% 1	21.74% 5	73.91% 17	23
Flooding	29.17% 7	37.50% 9	33.33% 8	24
Hurricane/Tropical Storm	44.00% 11	32.00% 8	24.00% 6	25
Landslide	0.00% 0	13.64% 3	86.36% 19	22
Severe Thunderstorm	60.00% 15	32.00% 8	8.00% 2	25
Severe Winter Storm	64.00% 16	28.00% 7	8.00% 2	25
Sinkhole	0.00% 0	34.78% 8	65.22% 15	23
Tornado	41.67% 10	54.17% 13	4.17% 1	24
Wildfire	4.17% 1	29.17% 7	66.67% 16	24
Other (from previous question)	0.00% 0	0.00% 0	100.00% 10	10

Q4 In your opinion, which of the following categories are most susceptible to natural hazards in your community? (Rank the community assets in order of vulnerability, 1 being most vulnerable and 6 being least vulnerable.) Please note, the list will automatically re-order itself as you make your selections. You can also drag and drop the items on the list to reorder them.

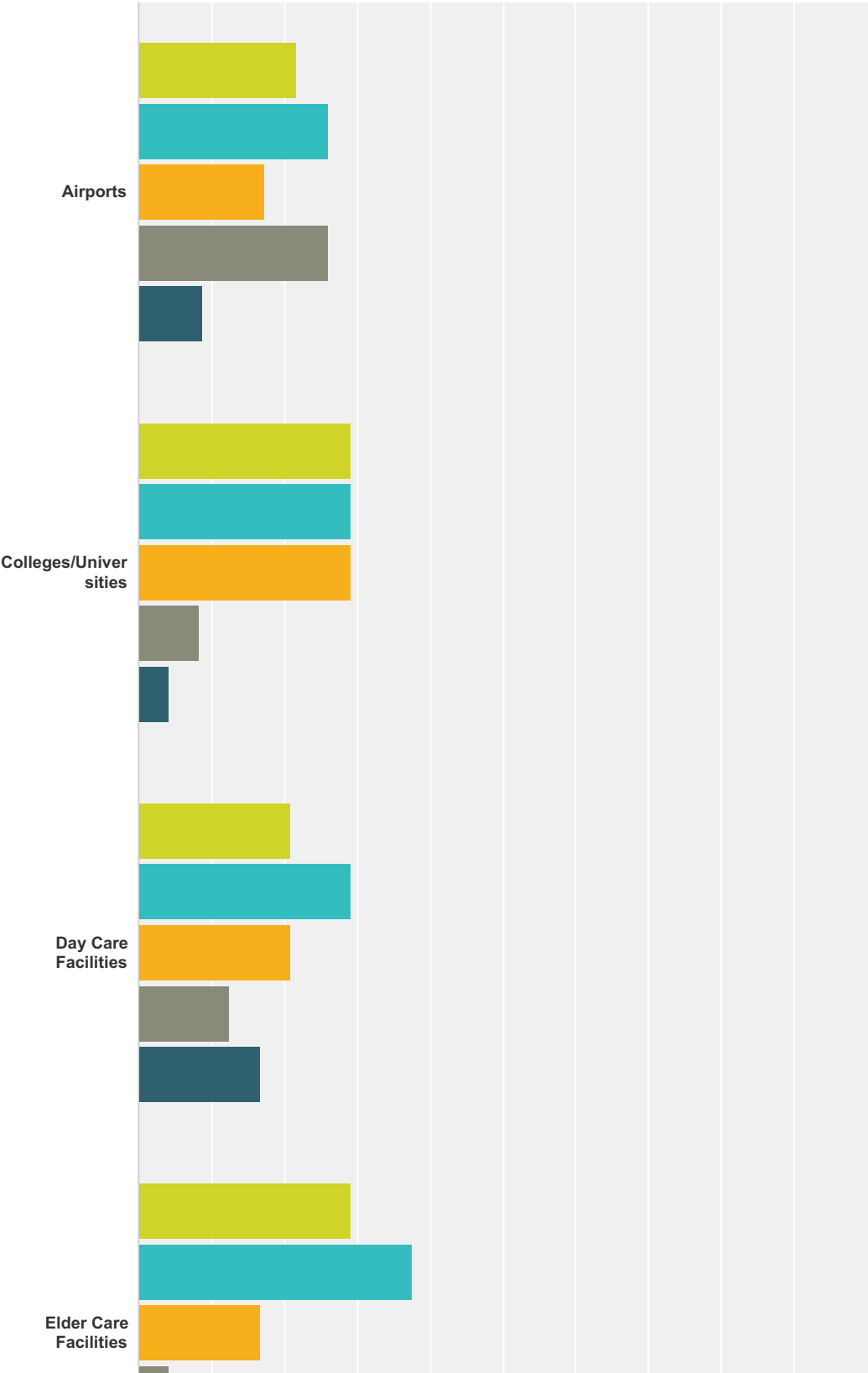
Answered: 23 Skipped: 2

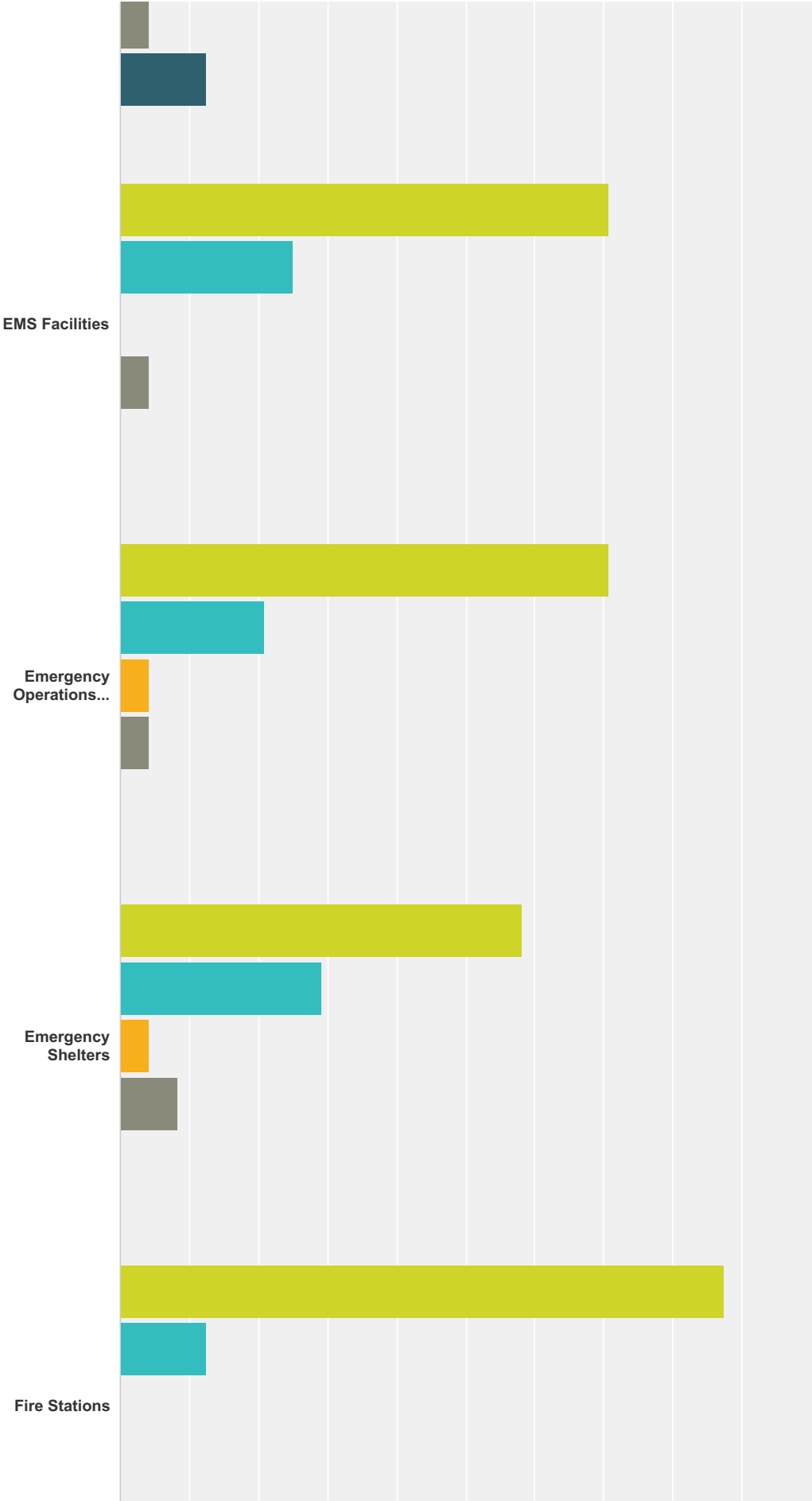


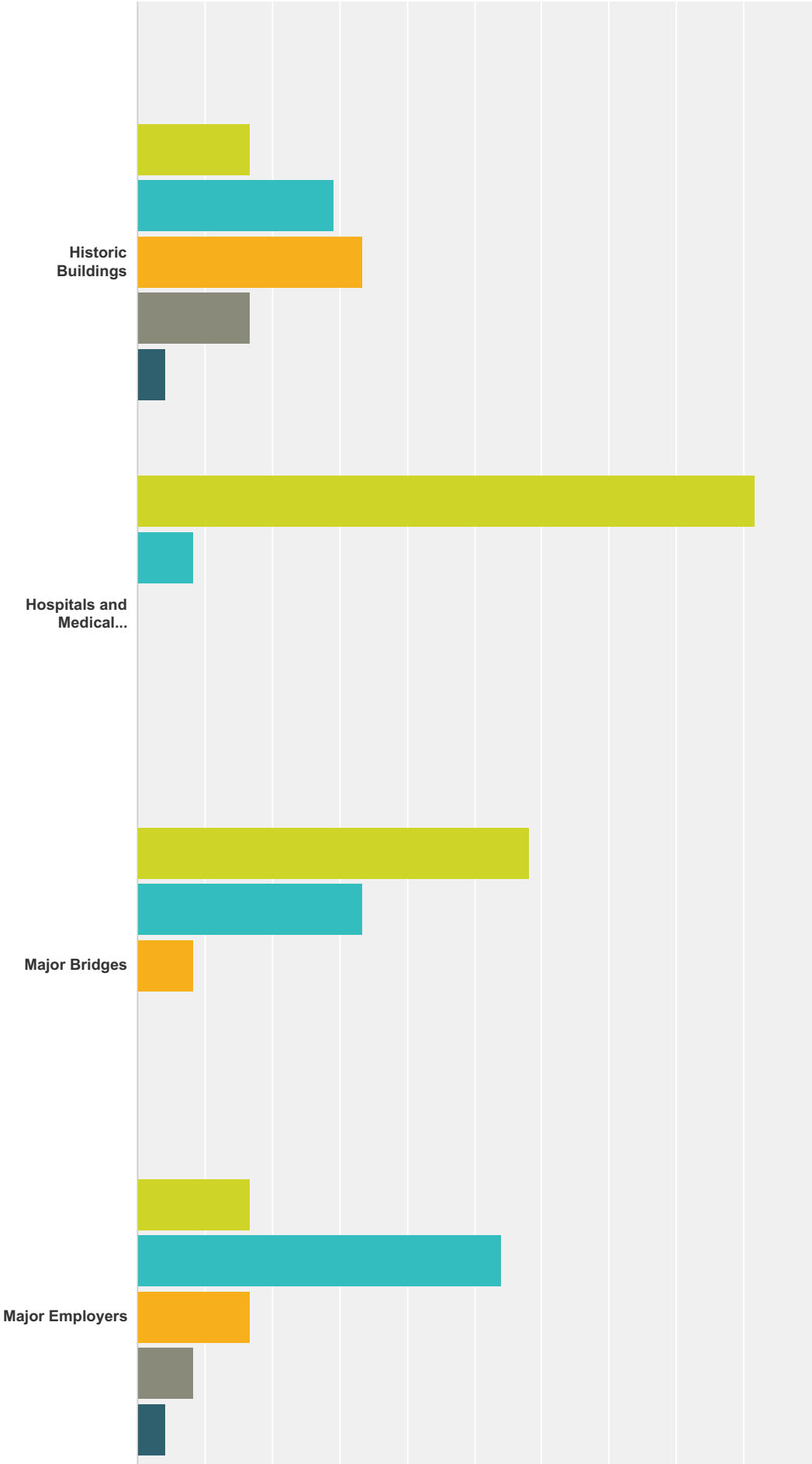
	1	2	3	4	5	6	Total	Score
Cultural/Historic: Damage or loss of libraries, museums, historic properties, etc.	4.35% 1	8.70% 2	4.35% 1	8.70% 2	17.39% 4	56.52% 13	23	2.04
Economic: Business interruptions/closures, job losses, etc.	17.39% 4	13.04% 3	26.09% 6	26.09% 6	17.39% 4	0.00% 0	23	3.87
Environmental: Damage, contamination or loss of forests, wetlands, waterways, etc.	8.70% 2	8.70% 2	26.09% 6	13.04% 3	30.43% 7	13.04% 3	23	3.13
Governance: Ability to maintain order and/or provide public amenities and services	0.00% 0	4.35% 1	21.74% 5	39.13% 9	13.04% 3	21.74% 5	23	2.74
Infrastructure: Damage/loss of roads, bridges, utilities, schools, etc.	21.74% 5	56.52% 13	8.70% 2	8.70% 2	4.35% 1	0.00% 0	23	4.83
People: Loss of life and/or injuries	47.83% 11	8.70% 2	13.04% 3	4.35% 1	17.39% 4	8.70% 2	23	4.39

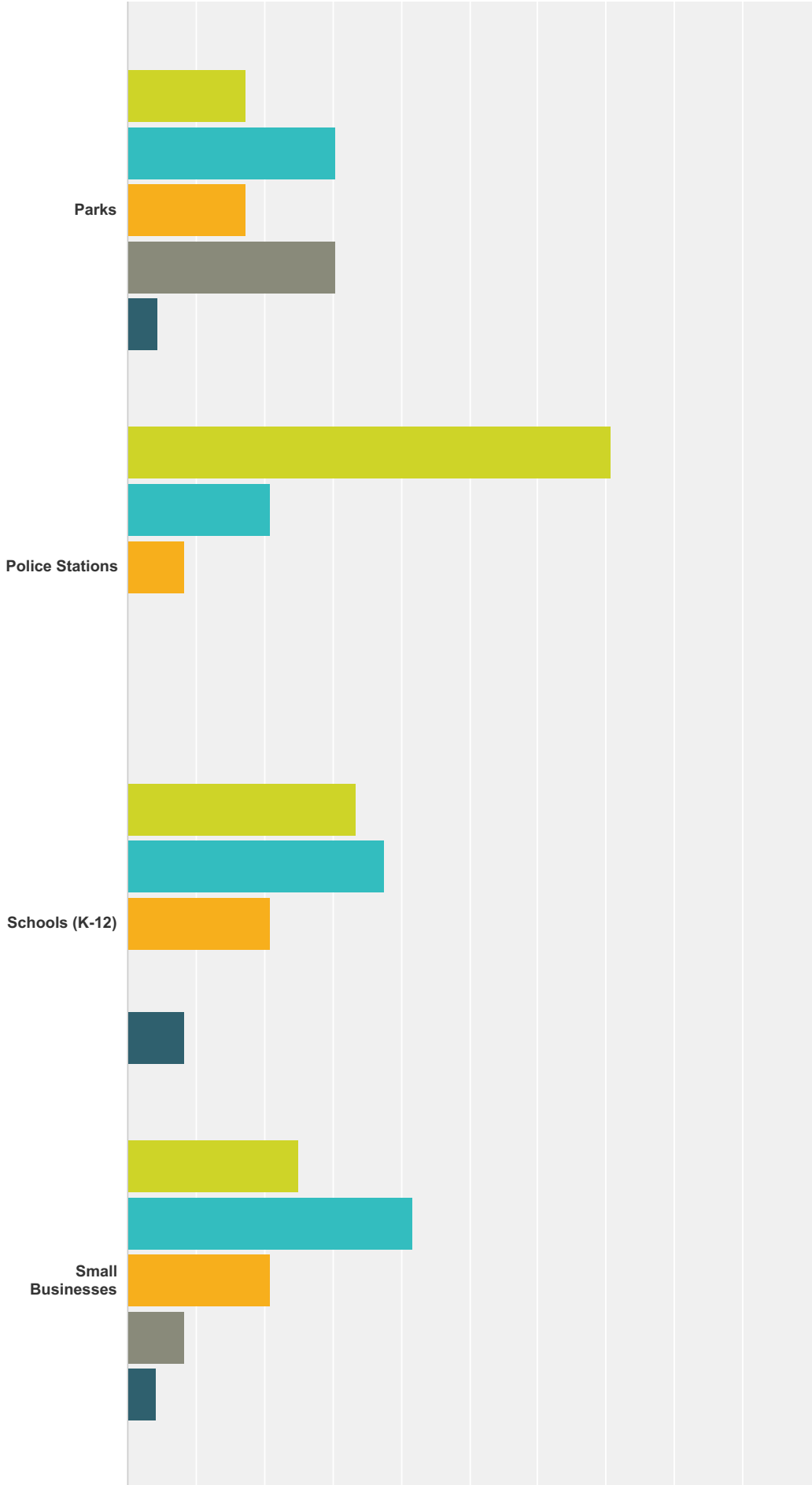
Q5 How important is each of the following specific community assets to you? (Check the appropriate circle for each asset.)

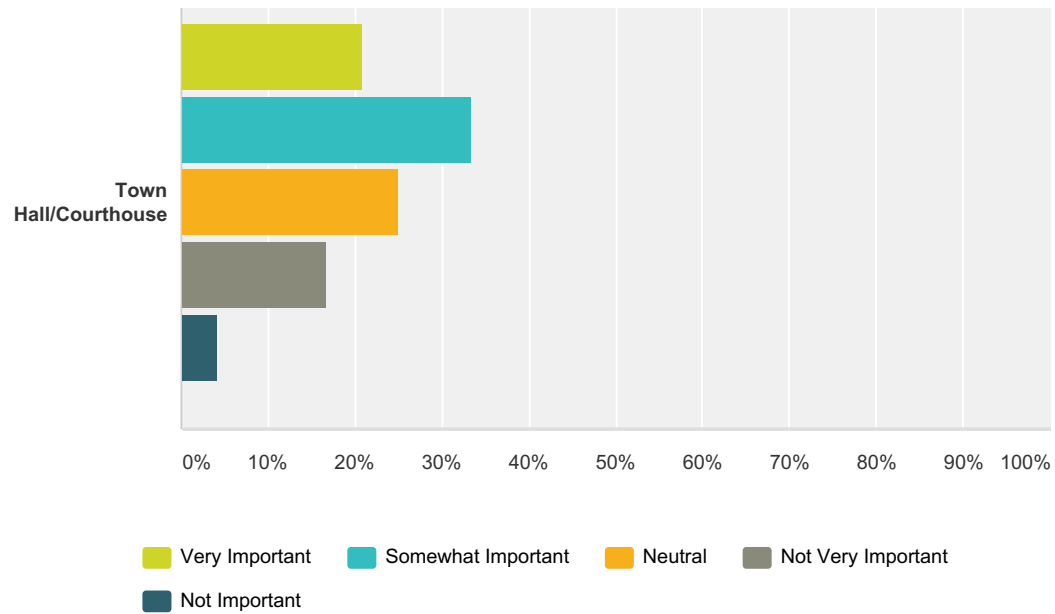
Answered: 24 Skipped: 1











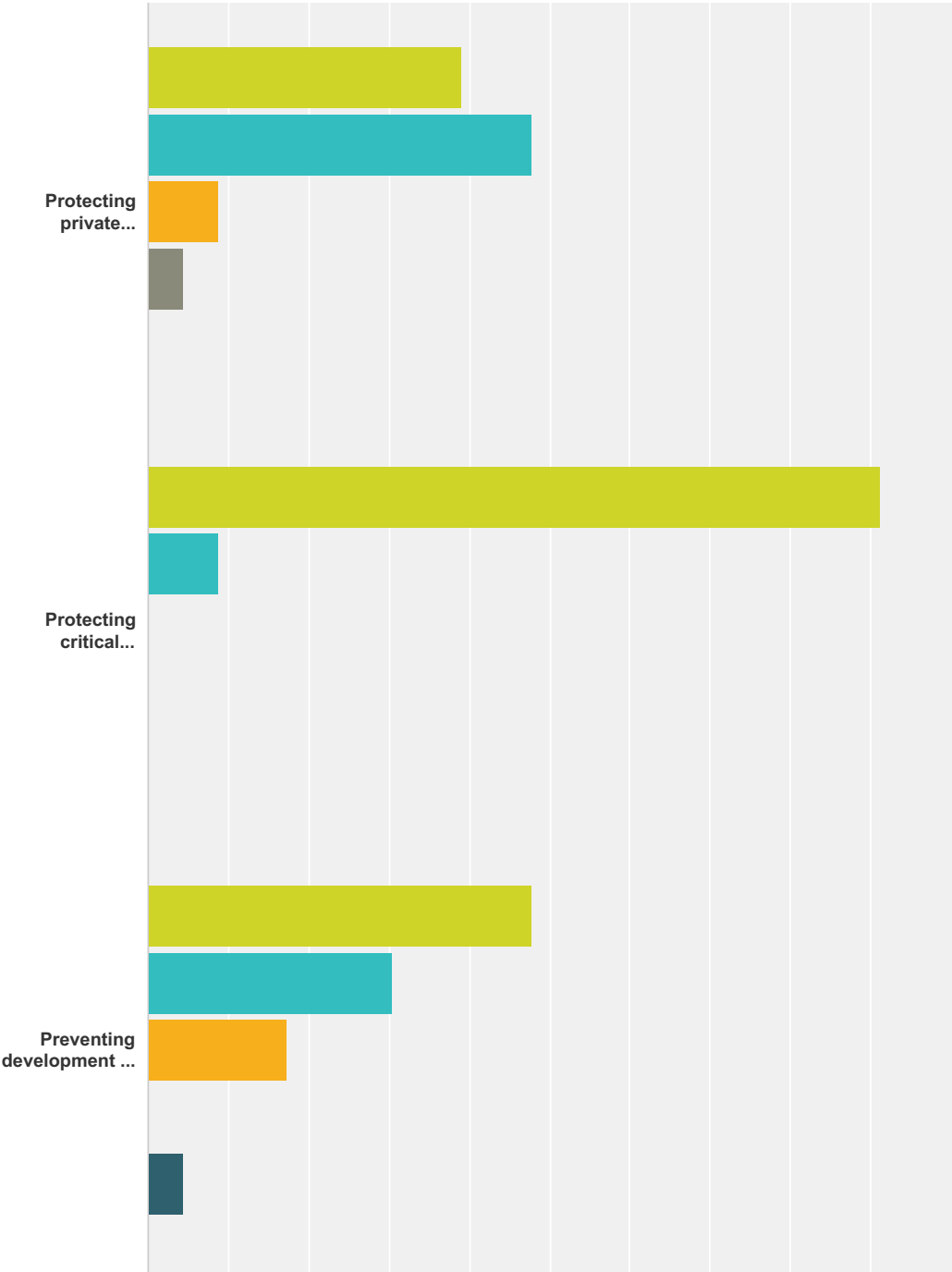
	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important	Total
Airports	21.74% 5	26.09% 6	17.39% 4	26.09% 6	8.70% 2	23
Colleges/Universities	29.17% 7	29.17% 7	29.17% 7	8.33% 2	4.17% 1	24
Day Care Facilities	20.83% 5	29.17% 7	20.83% 5	12.50% 3	16.67% 4	24
Elder Care Facilities	29.17% 7	37.50% 9	16.67% 4	4.17% 1	12.50% 3	24
EMS Facilities	70.83% 17	25.00% 6	0.00% 0	4.17% 1	0.00% 0	24
Emergency Operations Centers	70.83% 17	20.83% 5	4.17% 1	4.17% 1	0.00% 0	24
Emergency Shelters	58.33% 14	29.17% 7	4.17% 1	8.33% 2	0.00% 0	24
Fire Stations	87.50% 21	12.50% 3	0.00% 0	0.00% 0	0.00% 0	24
Historic Buildings	16.67% 4	29.17% 7	33.33% 8	16.67% 4	4.17% 1	24
Hospitals and Medical Facilities	91.67% 22	8.33% 2	0.00% 0	0.00% 0	0.00% 0	24
Major Bridges	58.33% 14	33.33% 8	8.33% 2	0.00% 0	0.00% 0	24
Major Employers	16.67% 4	54.17% 13	16.67% 4	8.33% 2	4.17% 1	24
Parks	17.39% 4	30.43% 7	17.39% 4	30.43% 7	4.35% 1	23
Police Stations	70.83% 17	20.83% 5	8.33% 2	0.00% 0	0.00% 0	24

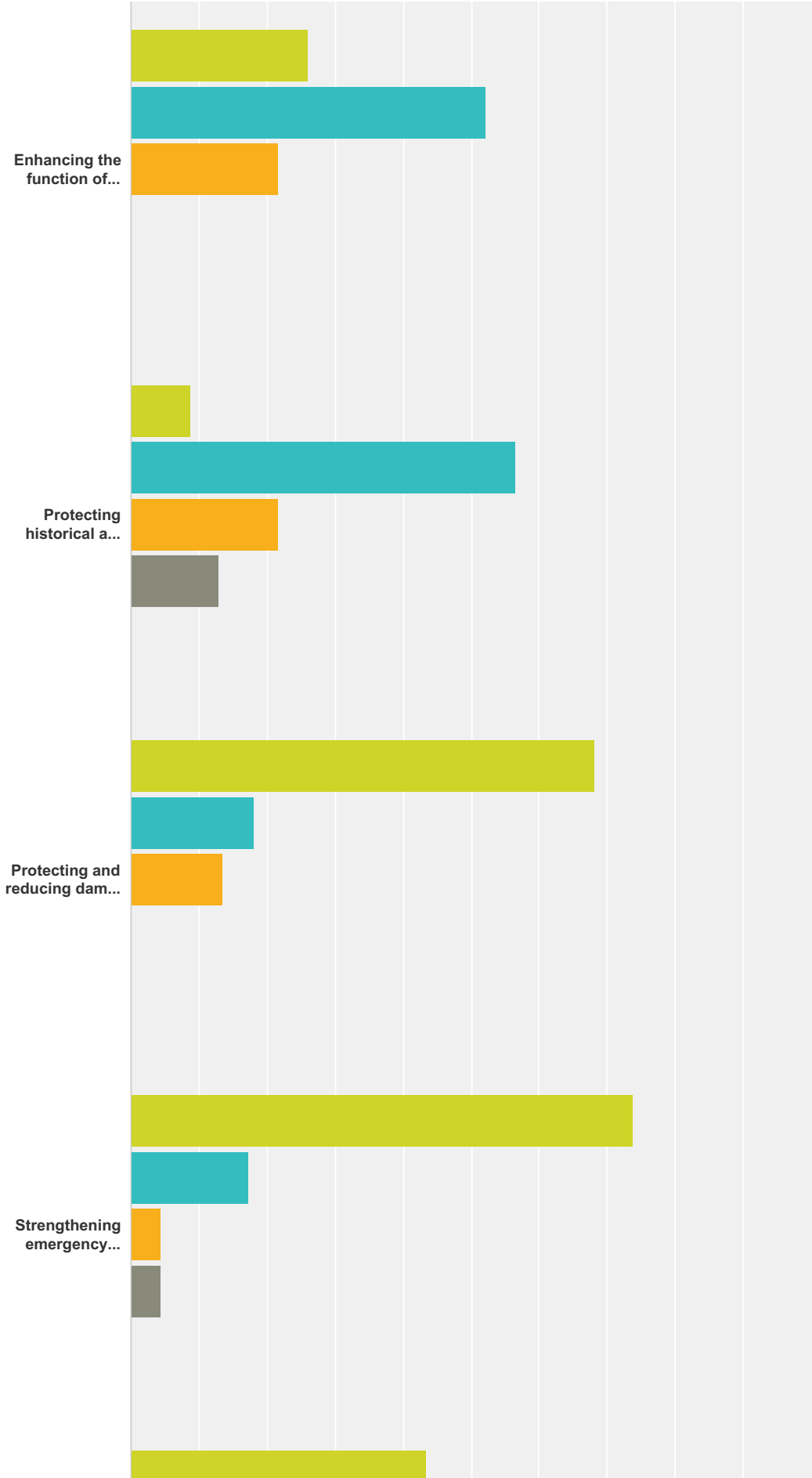
Schools (K-12)	33.33% 8	37.50% 9	20.83% 5	0.00% 0	8.33% 2	24
Small Businesses	25.00% 6	41.67% 10	20.83% 5	8.33% 2	4.17% 1	24
Town Hall/Courthouse	20.83% 5	33.33% 8	25.00% 6	16.67% 4	4.17% 1	24

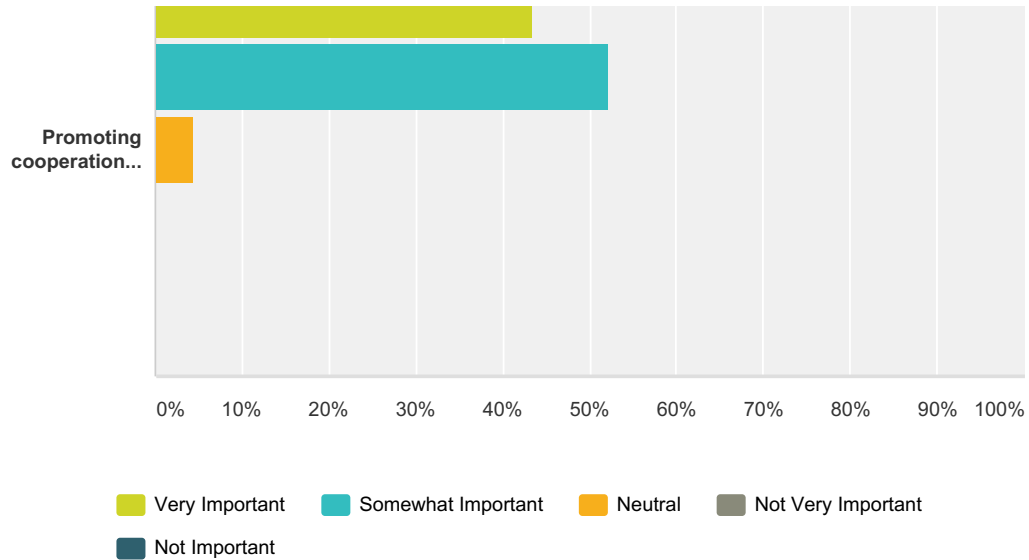
#	Other (please specify)	Date
	There are no responses.	

Q6 Natural hazards can have a significant impact on a community, but planning for these types of events can help lessen the impacts. The following statements will help us determine citizen priorities regarding planning for natural hazards in your community. Please tell us how important each statement is to you by checking the appropriate circle for each.

Answered: 23 Skipped: 2







	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important	Total
Protecting private property	39.13% 9	47.83% 11	8.70% 2	4.35% 1	0.00% 0	23
Protecting critical facilities (for example, hospitals, police stations, fire stations, etc.)	91.30% 21	8.70% 2	0.00% 0	0.00% 0	0.00% 0	23
Preventing development in hazard areas	47.83% 11	30.43% 7	17.39% 4	0.00% 0	4.35% 1	23
Enhancing the function of natural features (for example, streams, wetlands, etc.)	26.09% 6	52.17% 12	21.74% 5	0.00% 0	0.00% 0	23
Protecting historical and cultural landmarks	8.70% 2	56.52% 13	21.74% 5	13.04% 3	0.00% 0	23
Protecting and reducing damage to utilities	68.18% 15	18.18% 4	13.64% 3	0.00% 0	0.00% 0	22
Strengthening emergency services (for example, police, fire, ambulance)	73.91% 17	17.39% 4	4.35% 1	4.35% 1	0.00% 0	23
Promoting cooperation among public agencies, citizens, non-profit organizations, and businesses	43.48% 10	52.17% 12	4.35% 1	0.00% 0	0.00% 0	23

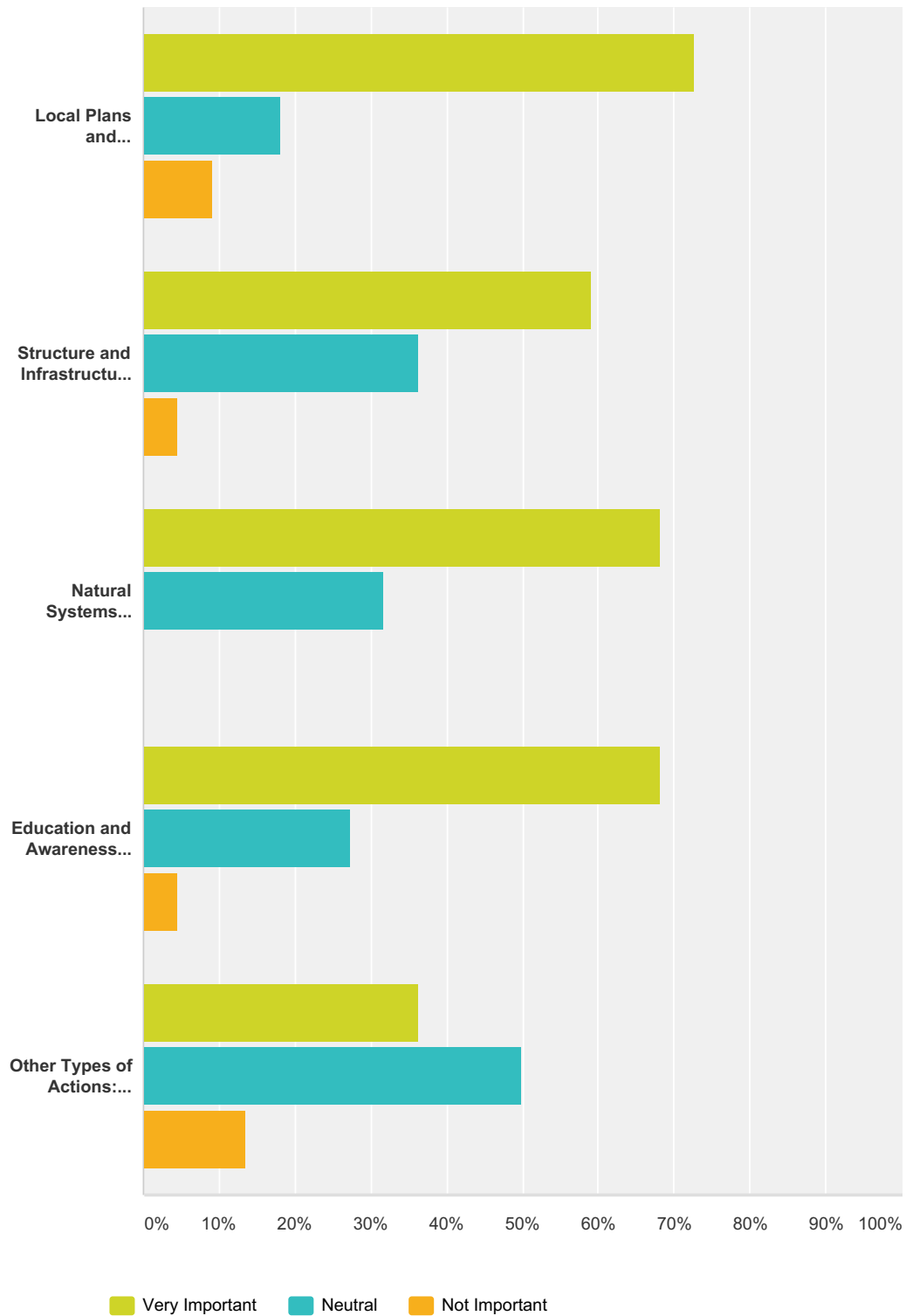
Q7 What are some steps that your local government could take to reduce or eliminate the risk of future natural hazard damages in your neighborhood?

Answered: 10 Skipped: 15

#	Responses	Date
1	Promote local businesses to strengthen our support network, aggressively promote climate change mitigation, decentralize the power grid	11/26/2014 5:32 PM
2	Bury power lines; prepare a talk or demonstration for the neighborhood about the emergency processes in place and how to access them.	11/26/2014 4:21 PM
3	Stop building more houses/buildings by clear-cutting trees.	11/24/2014 4:19 PM
4	Install drainage pipes	11/24/2014 3:59 PM
5	community storm shelters. There are numerous older homes without basements that would be unable to withstand EF2+ tornado and there are no public buildings or community shelters available as safe places for citizens to go to.	11/24/2014 1:09 PM
6	Strategic Planning; pre-positioned sites for debris management	11/24/2014 12:43 PM
7	repair and maintain storm drains	11/20/2014 4:21 PM
8	Better tree removal along powerlines and utility lines	11/18/2014 11:07 PM
9	More preventative action (in a way similar to salting the roads before a snow storm, adding more drains in low-level areas, etc)	11/13/2014 11:55 PM
10	Provide funding	11/12/2014 10:10 AM

Q8 A number of community-wide activities can reduce risk from natural hazards. In general, these activities fall into one of the following five broad categories. Please tell us how important you think each one is for your community to consider pursuing.

Answered: 22 Skipped: 3

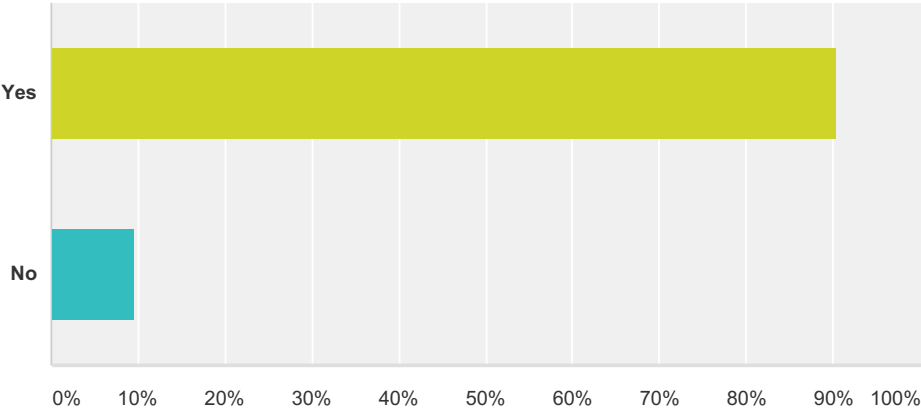


	Very Important	Neutral	Not Important	Total
Local Plans and Regulations: Government authorities, policies, or codes that influence the way land and buildings are developed and built.	72.73% 16	18.18% 4	9.09% 2	22
Structure and Infrastructure Projects: Modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area.	59.09% 13	36.36% 8	4.55% 1	22

Natural Systems Protection: Actions that minimize damage and losses and also preserve or restore the functions of natural systems.	68.18% 15	31.82% 7	0.00% 0	22
Education and Awareness Programs: Actions that inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.	68.18% 15	27.27% 6	4.55% 1	22
Other Types of Actions: Actions that are related to mitigation in ways that make sense to the local government that do not fall into one of the categories above.	36.36% 8	50.00% 11	13.64% 3	22

Q9 Are you interested in making your home or neighborhood more resistant to natural hazards?

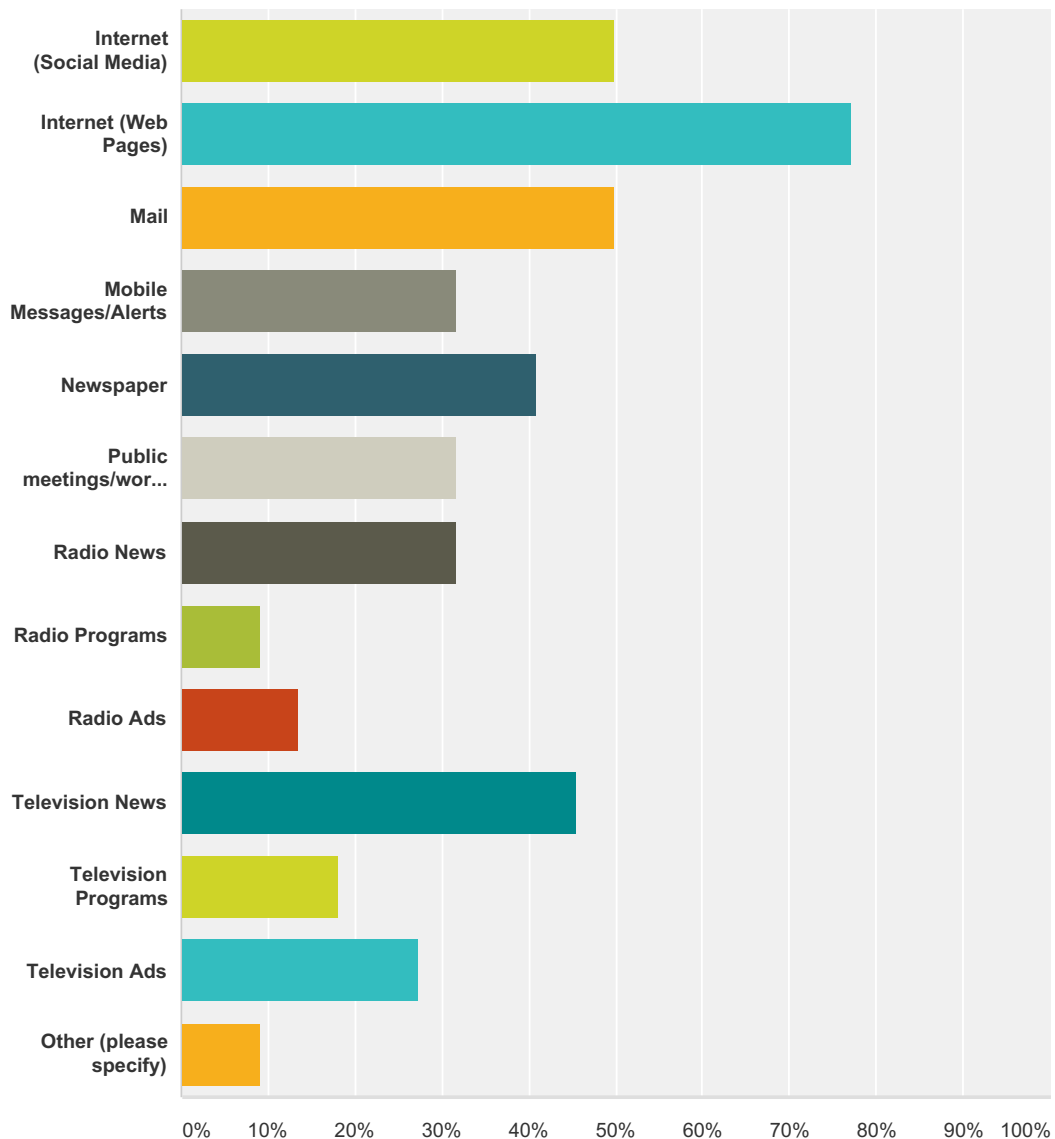
Answered: 21 Skipped: 4



Answer Choices	Responses	
Yes	90.48%	19
No	9.52%	2
Total		21

Q10 What are the most effective ways for you to receive information about how to make your home and neighborhood more resistant to natural hazards?

Answered: 22 Skipped: 3



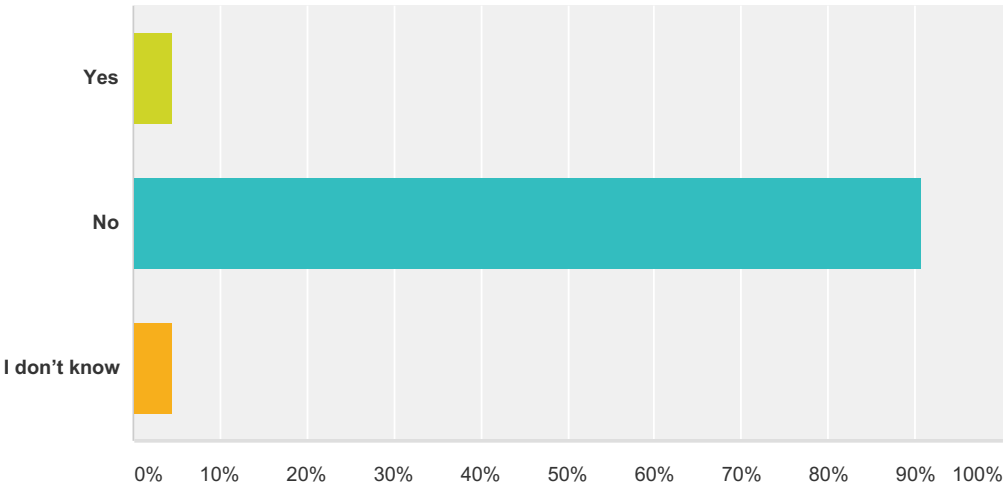
Answer Choices	Responses	
Internet (Social Media)	50.00%	11
Internet (Web Pages)	77.27%	17
Mail	50.00%	11
Mobile Messages/Alerts	31.82%	7
Newspaper	40.91%	9

Public meetings/workshops	31.82%	7
Radio News	31.82%	7
Radio Programs	9.09%	2
Radio Ads	13.64%	3
Television News	45.45%	10
Television Programs	18.18%	4
Television Ads	27.27%	6
Other (please specify)	9.09%	2
Total Respondents: 22		

#	Other (please specify)	Date
1	e-mail	11/26/2014 5:33 PM
2	Email	11/13/2014 9:41 PM

Q11 Is your home located in a floodplain?

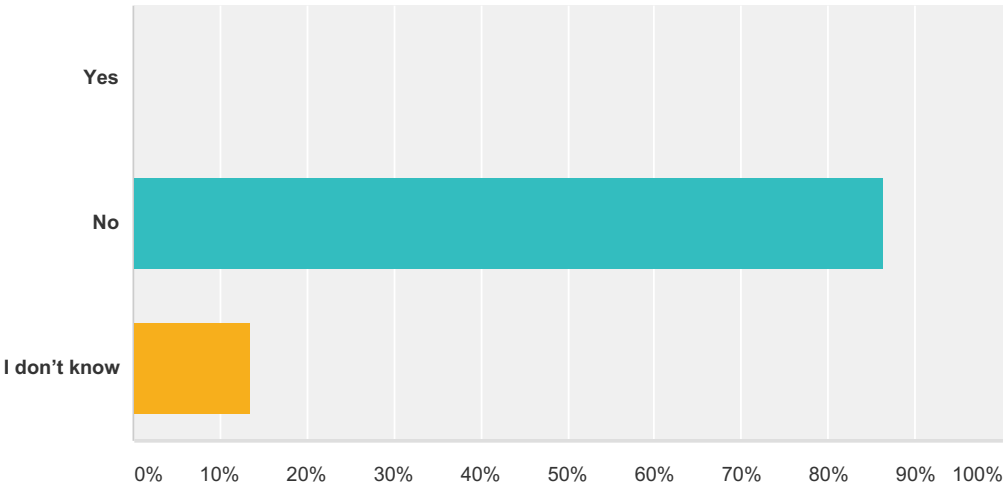
Answered: 22 Skipped: 3



Answer Choices	Responses	
Yes	4.55%	1
No	90.91%	20
I don't know	4.55%	1
Total		22

Q12 Do you have flood insurance?

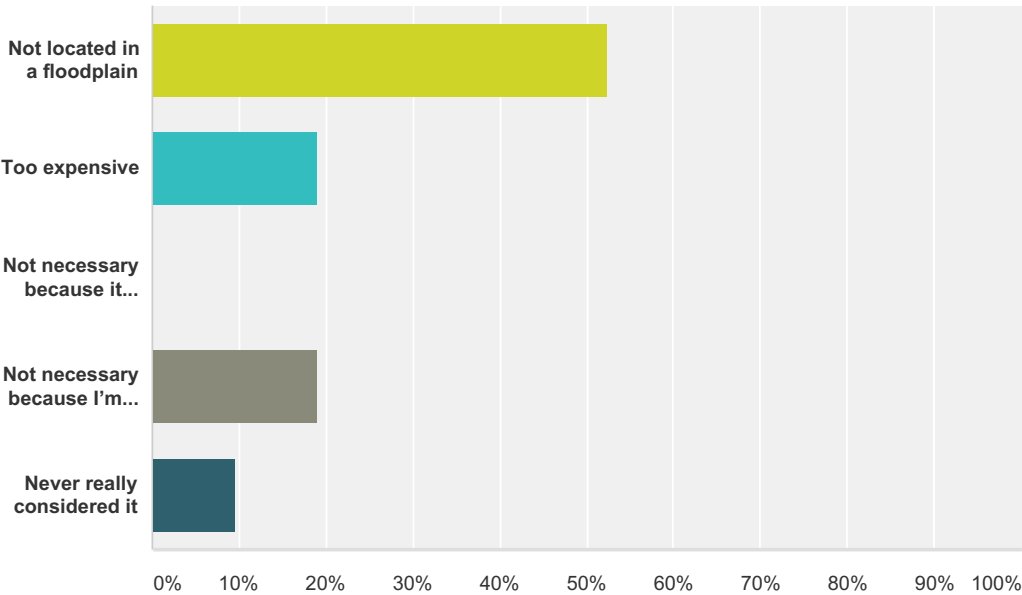
Answered: 22 Skipped: 3



Answer Choices	Responses
Yes	0.00%0
No	86.36%19
I don't know	13.64%3
Total	22

Q13 If “No,” why not?

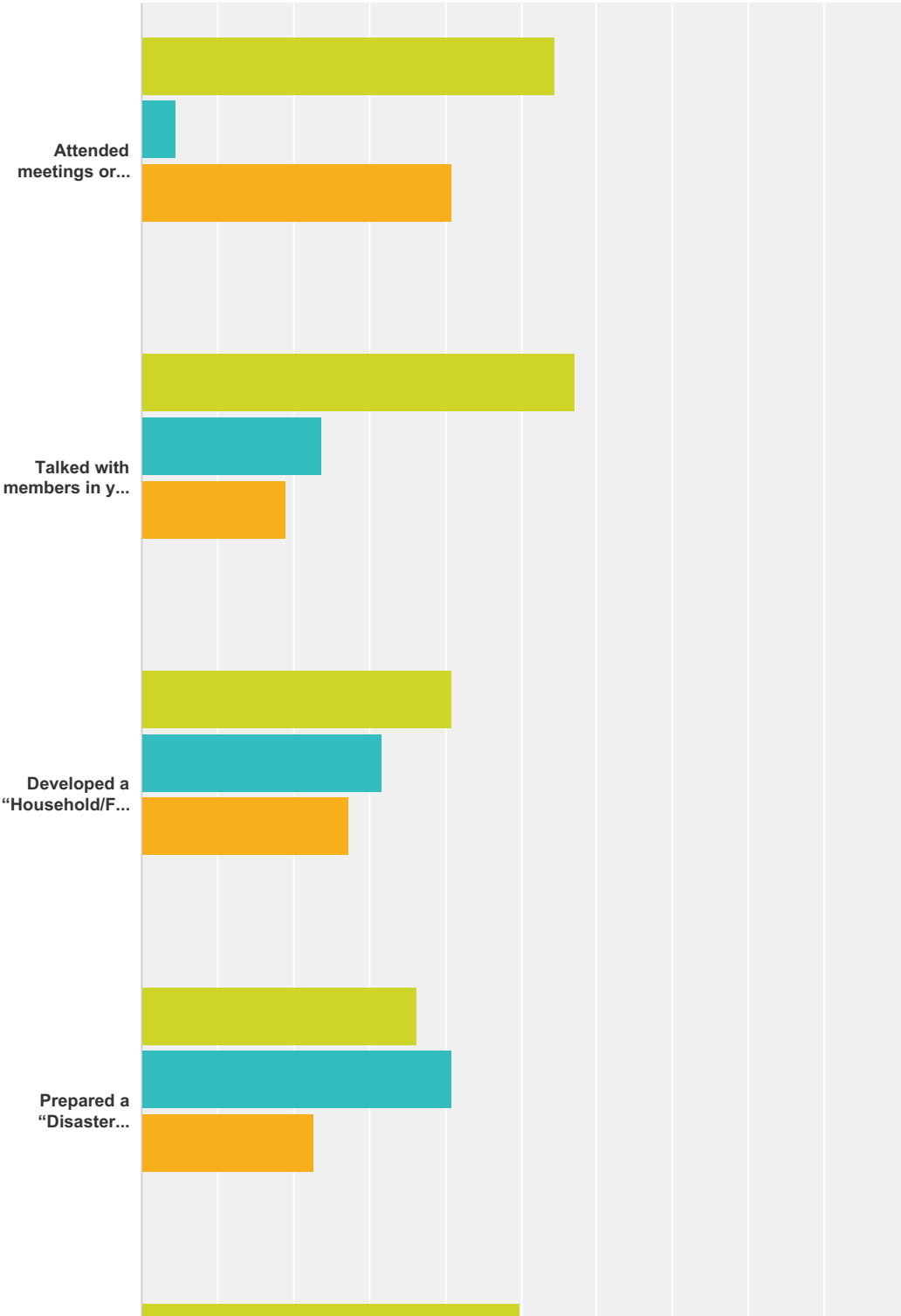
Answered: 21 Skipped: 4

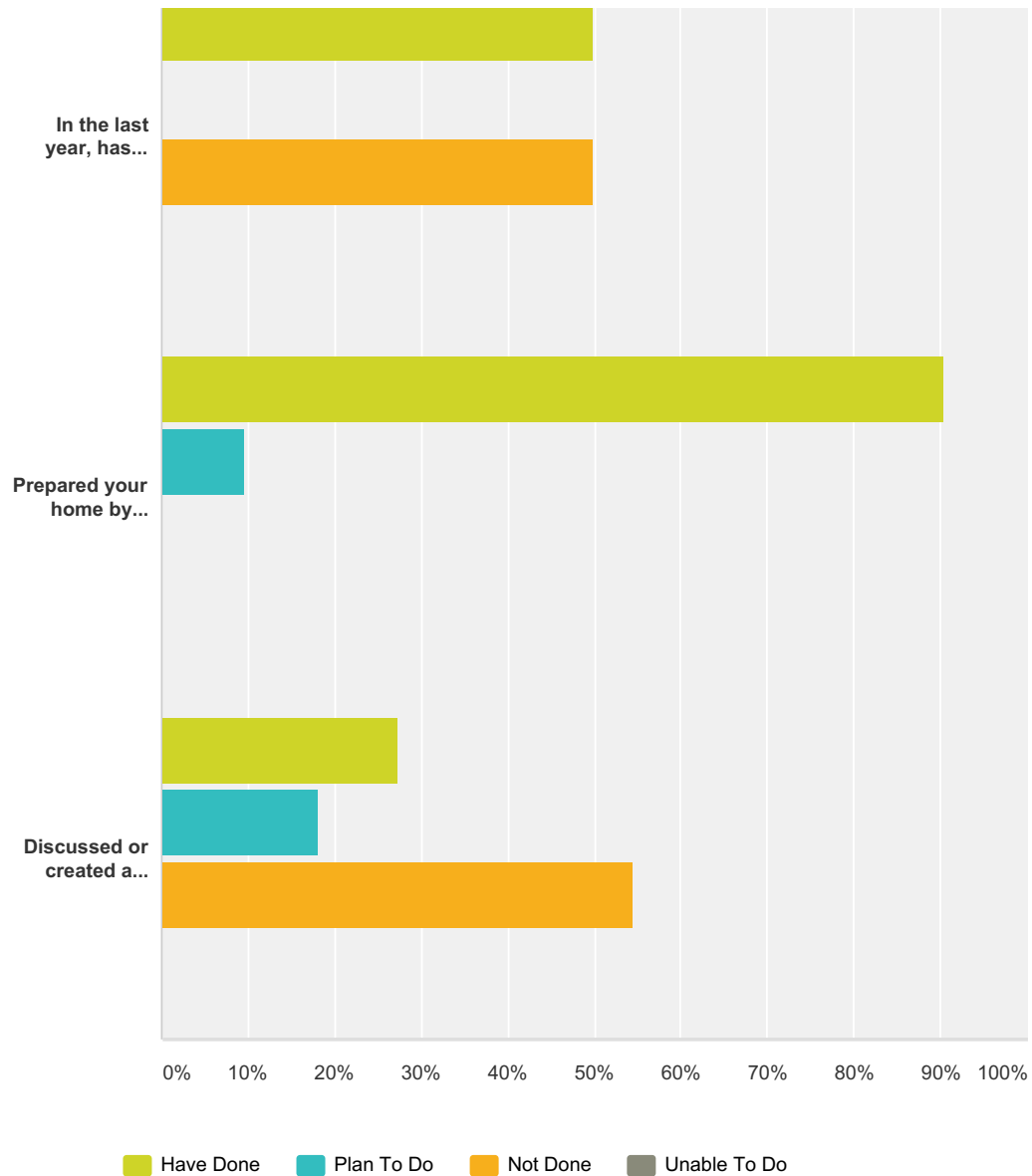


Answer Choices	Responses	
Not located in a floodplain	52.38%	11
Too expensive	19.05%	4
Not necessary because it never floods	0.00%	0
Not necessary because I'm elevated or otherwise protected	19.05%	4
Never really considered it	9.52%	2
Total		21

Q14 In the following list, please check the activities that you have done in your household, plan to do in the near future, have not done, or are unable to do. (Please check one response for each preparedness activity.)

Answered: 22 Skipped: 3



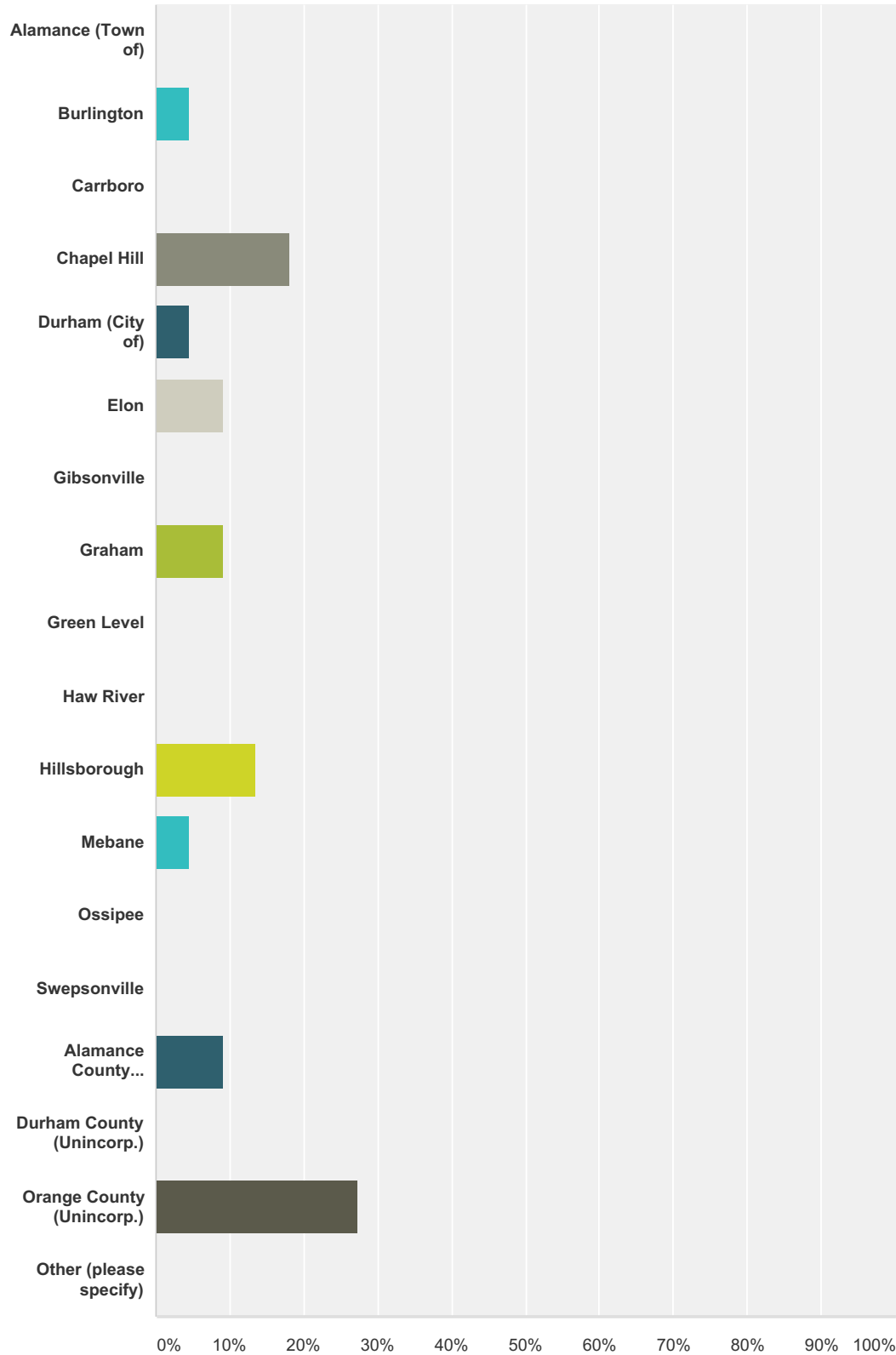


	Have Done	Plan To Do	Not Done	Unable To Do	Total
Attended meetings or received written information on natural disasters or emergency preparedness?	54.55% 12	4.55% 1	40.91% 9	0.00% 0	22
Talked with members in your household about what to do in case of a natural disaster or emergency?	57.14% 12	23.81% 5	19.05% 4	0.00% 0	21
Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?	40.91% 9	31.82% 7	27.27% 6	0.00% 0	22
Prepared a "Disaster Supply Kit" (stored extra food, water, batteries or other emergency supplies)?	36.36% 8	40.91% 9	22.73% 5	0.00% 0	22
In the last year, has anyone in your household been trained in First Aid or Cardio-Pulmonary Resuscitation (CPR)?	50.00% 11	0.00% 0	50.00% 11	0.00% 0	22
Prepared your home by installing smoke detectors on each level of the house?	90.48% 19	9.52% 2	0.00% 0	0.00% 0	21
Discussed or created a utility shutoff procedure in the event of a natural disaster?	27.27% 6	18.18% 4	54.55% 12	0.00% 0	22

#	Other (please specify)	Date
	There are no responses.	

Q15 Where do you live?

Answered: 22 Skipped: 3



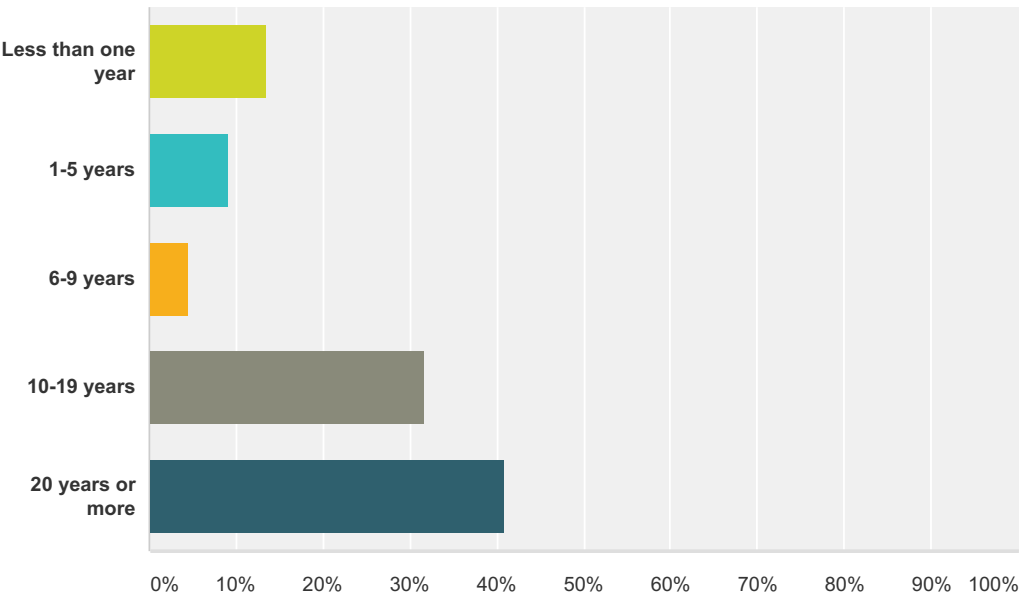
Answer Choices	Responses
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Alamance (Town of)	0.00%	0
Burlington	4.55%	1
Carrboro	0.00%	0
Chapel Hill	18.18%	4
Durham (City of)	4.55%	1
Elon	9.09%	2
Gibsonville	0.00%	0
Graham	9.09%	2
Green Level	0.00%	0
Haw River	0.00%	0
Hillsborough	13.64%	3
Mebane	4.55%	1
Ossipee	0.00%	0
Swepsonville	0.00%	0
Alamance County (Unincorp.)	9.09%	2
Durham County (Unincorp.)	0.00%	0
Orange County (Unincorp.)	27.27%	6
Other (please specify)	0.00%	0
Total		22

#	Other (please specify)	Date
	There are no responses.	

Q16 How long have you lived in Alamance, Durham or Orange County?

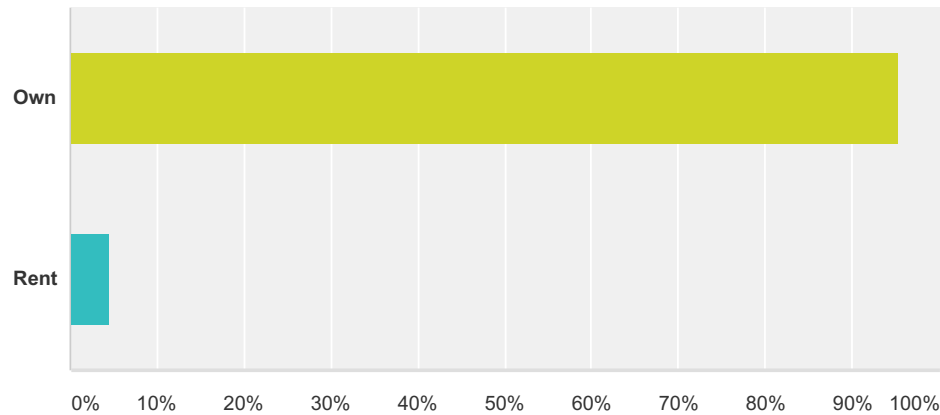
Answered: 22 Skipped: 3



Answer Choices	Responses
Less than one year	13.64%3
1-5 years	9.09%2
6-9 years	4.55%1
10-19 years	31.82%7
20 years or more	40.91%9
Total	22

Q17 Do you own or rent your home?

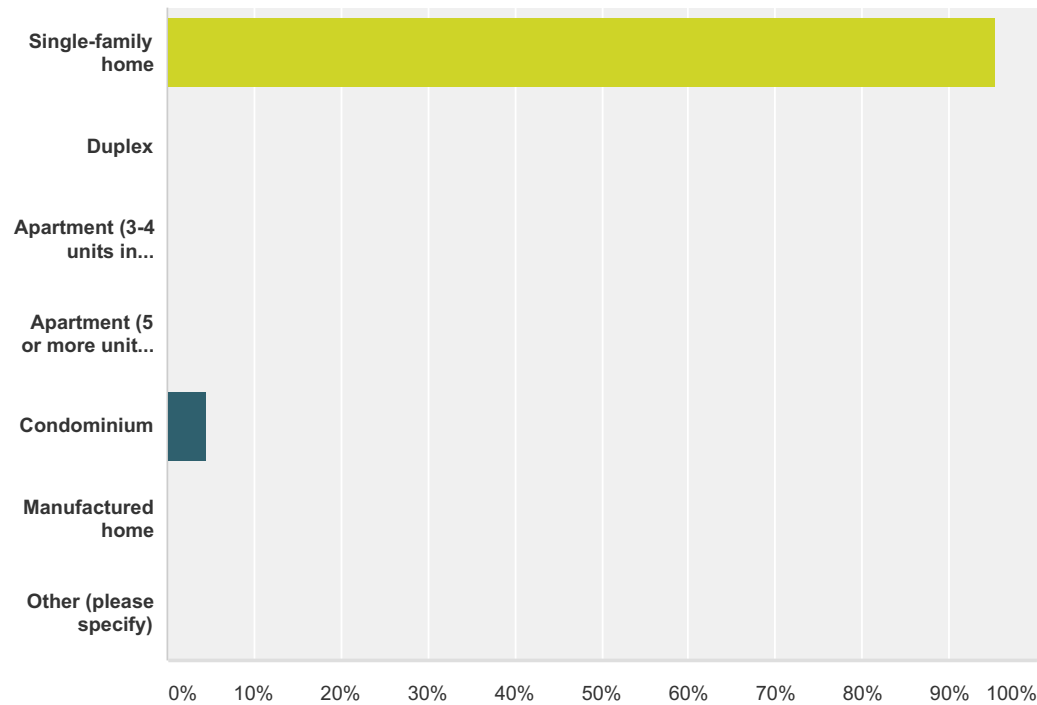
Answered: 22 Skipped: 3



Answer Choices	Responses	
Own	95.45%	21
Rent	4.55%	1
Total		22

Q18 What type of building do you live in?

Answered: 22 Skipped: 3



Answer Choices	Responses
Single-family home	95.45%21
Duplex	0.00%0
Apartment (3-4 units in structure)	0.00%0
Apartment (5 or more units in structure)	0.00%0
Condominium	4.55%1
Manufactured home	0.00%0
Other (please specify)	0.00%0
Total	22

#	Other (please specify)	Date
	There are no responses.	

Q19 Additional Comments

Answered: 2 Skipped: 23

#	Responses	Date
1	In Orange County they are not worried about the unincorporated areas. Chapel Hill is the only area of any concern and everyone else has to fend for theirself.	11/24/2014 4:02 PM
2	I think this is a make work program for planners and excess emergency response manpower. Most people are unaware of what can happen to them and unwilling to inconvenience themselves with training or preparation. Beyond a moderate ability to clear roads, run basic EMS, fight house fires, and keep power on, I don't want much from government. Generally speaking, we are currently over-prepared and there is NO historical precedent for our needing more emergency preparedness. A severe tornado is the only event I can imagine that might be worse than Fran and its effect would be localized. We have several more important things too worry about. The fact that you might be able to draw in some "Federal Money" does not automatically make something a good idea or worth doing! Fix the schools! Fix the roads! Stop discouraging development and get some revenue generating development to help with our ridiculous tax burden!	11/24/2014 1:42 PM

Appendix E: Copies of Meeting Agendas and Sign-in Sheets

This appendix to the Eno-Haw Regional Hazard Mitigation Plan contains a collection of meeting agendas and sign-in sheets for the Hazard Mitigation Planning Team meetings and public meetings held as part of this planning process. Further details about each meeting (i.e., meeting minutes) can be found in Section 2: *Planning Process*. PowerPoint slides for each meeting are available from Orange County Emergency Services.

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Regional Hazard Mitigation Plan

Project Kickoff Meeting/ Regional Planning Team Meeting #1

Monday, August 11, 2014

1:30 p.m. – 3:30 p.m.

Orange County Emergency Services
510 Meadowlands Drive, Hillsborough, NC
Emergency Coordination Center Room (ECC/EOC)

AGENDA

- | | |
|---|-------------|
| 1. Welcome and Introductions | 1:30 – 1:40 |
| 2. Project Overview | 1:40 – 2:05 |
| <ul style="list-style-type: none">• Purpose, scope and schedule• Risk Management Tool (RMT)• Roles and responsibilities | |
| 3. Review and Discussion of Existing Plans | 2:05 – 2:30 |
| 4. Plan Update and Integration Process | 2:30 – 3:15 |
| <ul style="list-style-type: none">• Planning team organization• Communication• Public outreach and stakeholder engagement• Leveraging existing resources | |
| 5. Open Discussion | 3:15 – 3:25 |
| <ul style="list-style-type: none">• Potential opportunities in regionalizing the plans• Potential obstacles or barriers• Naming the regional plan• Other local issues, concerns or ideas | |
| 6. Next Steps | 3:25 – 3:30 |

Regional Hazard Mitigation Plan Kickoff Meeting (Alamance-Durham-Orange)

DATE: August 11, 2014

TIME: 1:30PM

LOCATION: Orange County Emergency Services, Hillsborough

<u>NAME</u>	<u>SIGNATURE</u>
Ashley Moncado	✓ Ashley Moncado
Craig Benedict	✓ Craig Benedict
Dalton Sawyer	✓ Randy Hoffman (for Dalton)
David Leonard	✓ David Leonard
Frank Meadows ROGER J. FRY	R.D. Fry
Hope Morgan	
Indira Everett	
James Groves	
Jason Shepherd	
Jeff Reily	
John Crew	✓ John Crew
John Greene	
Josh Hollingsworth	
Kim Woodward	✓ Kim Woodward

Kirby Saunders	✓	<i>W. Saunders</i>
Leslie O'Connor	✓	<i>Leslie O'Connor</i>
Mark Schell	✓	<i>Mark Schell Durham CO. EM</i>
Matt Sullivan	MATT LAWRENCE	<i>/M. Lawrence</i> Chapel Hill Fire Prot.
Michael Gilbert		
Perdita Holtz		<i>Ashley Moncada Ashley Moncada</i>
Ricky Tuttle	<i>Ricky Tuttle</i>	<i>ricky-tuttle@ncdps.gov</i>
Steve Powers		
Travis Crabtree		<i>Travis Crabtree</i>
Cindy Harrison	✓	<i>Carl Harrison NCEM</i>
Ryan Cox	✓	<i>Chad Cox NCEM</i>
Melissa Guilbeaux		<i>Melissa Cox City of Graham</i>
John Payne	✓	<i>John Payne ACEP</i>
Ava Sizemore	✓	<i>Ava Sizemore ACEM</i>
Roger Manual	✓	<i>Roger Manual City of Burlington</i>
Randy Holman		<i>Randy Holman UNC Hospitals</i>

MARCUS BRYANT

Sue Burke

DURHAM OH

Sue Burke Town of Chapel Hill

Regional Hazard Mitigation Plan

Regional Planning Team Meeting #2

Monday, September 15, 2014

1:30 p.m. – 3:30 p.m.

Orange County Emergency Services

510 Meadowlands Drive, Hillsborough, NC

Emergency Coordination Center Room (ECC/EOC)

AGENDA

- | | |
|--|-------------|
| 1. Welcome and Introductions | 1:30 – 1:40 |
| 2. Hazard Identification Exercise | 1:40 – 1:50 |
| 3. Public Outreach | 1:50 – 2:10 |
| <ul style="list-style-type: none">• Public Outreach Strategy• Online Public Participation Survey• Project Information Fact Sheet | |
| 4. Capability Assessments | 2:10 – 2:30 |
| <ul style="list-style-type: none">• Local Capability Assessment Survey• NFIP Survey• Safe Growth Survey | |
| 5. Vision Statement and Review of Current Goals | 2:30 – 2:40 |
| 6. Exercise Results and Discussion | 2:40 – 3:00 |
| 7. Planning Resources | 3:00 – 3:15 |
| <ul style="list-style-type: none">• Local Mitigation Planning Handbook• Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards• Integrating Hazard Mitigation Into Local Planning | |
| 8. Open Discussion | 3:15 – 3:25 |
| <ul style="list-style-type: none">• Regional name• Other issues, concerns or ideas | |
| 9. Next Steps | 3:25 – 3:30 |

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10000000	10000000	10000000



AOD Regional Hazard Mitigation Plan
Multi-Jurisdictional Planning Team
September 15, 2014 – Orange County ES - EOC

JURISDICTION	NAME	TITLE/AFFILIATION	EMAIL
ALAMANCE COUNTY	John Payne/Hwa Sizemore	Ala. Co. EM	
Village of Alamance			
City of Burlington	Roger Manuel	See other sheet	
Town of Elon			
Town of Gibsonville			
City of Graham			
Town of Green Level			
Town of Haw River			
City of Mebane			
Town of Ossipee			
Town of Swepsonville			
DURHAM COUNTY	MARK SCHILL/Mphill	City/co. EMA (DURHAM/DUR CO)	mschill@dcnc.gov
City of Durham	Graham Summerson	City of Durham Public Works	graham.summerson@durhamnc.gov
ORANGE COUNTY	Ashley Moncado	Planning	amoncado@orangecountync.gov
Town of Carrboro	Irish McGuire	Planning	pmcguire@townofcarrboro.org
Town of Chapel Hill			
Town of Hillsborough			
UNC – Chapel Hill			
Local PM – Orange Co.	Kirby Saunders	EM Coordinator/Orange	kisaunders@orangecountync.gov
State PM – North Carolina	Ryan Cox	NCEM H/M Planning	ryan.cox@ncdps.gov
Planning - AECOM			



AECOM

Regional Hazard Mitigation Plan

Regional Planning Team Meeting #3

Thursday, December 4, 2014

10:00 a.m. – 2:00 p.m.

Whitted Human Services Building, Room 230

300 W Tryon Street, Hillsborough, NC

AGENDA

- | | |
|--|---------------|
| 1. Welcome and Introductions | 10:00 – 10:10 |
| 2. Risk Assessment Overview and Preliminary Findings | 10:10 – 11:30 |
| <ul style="list-style-type: none">• Hazards Addressed• Building Inventories and Demographic Data• Natural Hazards Discussion (by hazard)• Hazard Risk Ranking Discussion | |
| 3. Capability Assessment Overview and Prelim. Findings | 11:30 – 11:45 |
| 4. Working Lunch | 11:45 – 12:15 |
| 5. Public Outreach Update | 12:15 – 12:20 |
| 6. Mitigation Strategy Development | 12:20 – 1:45 |
| <ul style="list-style-type: none">• Vision Statement• Organization of Mitigation Strategy Section• Mitigation Action Plans (MAPs)• Types of Mitigation Actions• Mitigation Strategy Exercise | |
| 7. Open Discussion | 1:45 – 1:55 |
| 8. Next Steps | 1:55 – 2:00 |

Eno-Haw Regional Hazard Mitigation Plan
Multi-Jurisdictional Planning Team
December 4, 2014

JURISDICTION	NAME	TITLE/AFFILIATION	EMAIL
ALAMANCE COUNTY	<i>Alus Sizemore</i>	<i>Dep Fire Marshal / Asst EM Coord</i>	<i>alus.sizemore@alamance-nc.com</i>
Village of Alamance			
City of Burlington	<i>Rosemarie</i>	<i>em</i>	<i>rmazuel@ci.burlington.nc.us</i>
Town of Elon	<i>Sean Stencer</i>	<i>Town Planner</i>	<i>stencer@ci.elon.nc.us</i>
Town of Gibsonville			
City of Graham			
Town of Green Level			
Town of Haw River			
City of Mebane			
Town of Ossipee			
Town of Swepsonville			
DURHAM COUNTY	<i>Mark Schell</i>	<i>Durham County em</i>	<i>mschell@dcnc.gov</i>
City of Durham	<i>STEPHAN WINDSOR</i>	<i>CRS Coord</i>	<i>STEPHAN.WINDSOR@DURHAM.NC.GOV</i>
ORANGE COUNTY	<i>Josh Hollingsworth</i>	<i>EM Planner</i>	<i>jhollingsworth@orangecountync.gov</i>
Town of Carrboro	<i>TRAVIS CRABBE</i>	<i>Fire Chief</i>	<i>tcrabbe@townofcarrboro.org</i>
Town of Chapel Hill	<i>Matthew Sullivan</i>	<i>Emergency Mgmt Coord</i>	<i>msullivan@townofchapelhill.org</i>
Town of Hillsborough			
UNC – Chapel Hill			
<i>Town of Carrboro</i>	<i>Trish McGuire</i>	<i>Planning Director</i>	<i>pmcguire@townofcarrboro.org</i>
Local PM – Orange Co.	<i>Kirby Saunders</i>	<i>EM coord / ORANGE CO.</i>	<i>k.saunders@orangecountync.gov</i>
State PM – North Carolina	<i>Ryan Cox</i>	<i>Hazard Mitigation Planning</i>	<i>ryan.cox@ncdps.gov</i>
Planning - AECOM			



AECOM

**Eno-Haw Regional Hazard Mitigation Plan
Multi-Jurisdictional Planning Team
December 4, 2014**

[illegible]

Regional Hazard Mitigation Plan

Regional Planning Team Meeting #4

Friday, March 27, 2015

1:00 p.m. – 2:30 p.m.

Orange County Emergency Services

510 Meadowlands Drive, Hillsborough, NC

Emergency Coordination Center Room (ECC/EOC)

AGENDA

- | | |
|---|-------------|
| 1. Welcome and Introductions | 1:00 – 1:10 |
| 2. Overview of Working Draft | 1:10 – 2:00 |
| 3. Maintaining Momentum and Implementing the Plan | 2:00 – 2:15 |
| 4. Next Steps | 2:15 – 2:20 |
| 5. Open Discussion | 2:20 – 2:30 |

**Eno-Haw Regional Hazard Mitigation Plan
Multi-Jurisdictional Planning Team
March 27, 2015**

[illegible]

Eno-Haw Regional Hazard Mitigation Plan Multi-Jurisdictional Planning Team March 27, 2015

JURISDICTION	NAME	TITLE/AFFILIATION	EMAIL
ALAMANCE COUNTY			
Village of Alamance	Theresa	Food Bank	th@alamance.org
City of Burlington	Theresa	MAF	th@alamance.org
Town of Elon	Theresa	MAF	th@alamance.org
Town of Gibsonville			
City of Graham	Nathan Page	City Planner	npage@cityofgraham.com
Town of Green Level			
Town of Haw River			
City of Mebane			
Town of Ossipee			
Town of Swepsonville			
DURHAM COUNTY			
City of Durham			
ORANGE COUNTY			
Town of Carrboro	Josh Hollingsworth	Em Planner	
Town of Chapel Hill			
Town of Hillsborough			
UNC – Chapel Hill			
Local PM – Orange Co.	Kirby Sanders	EM Coordinator	
State PM – North Carolina			
Planning - AECOM			



Appendix F: Project Information Fact Sheet

This appendix to the Eno-Haw Regional Hazard Mitigation Plan contains a copy of the project information fact sheet that was developed to communicate information about the project to the general public and stakeholders, and to provide talking points for Hazard Mitigation Planning Team members.

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Eno-Haw Regional Hazard Mitigation Plan

Natural hazards have the potential to cause property damage, loss of life, economic hardship, and threats to public health and safety. Hazard mitigation measures are the things we do today to be more protected in the future. They are actions taken before a disaster happens to reduce the impact of future hazard events on people and property in the community. Mitigation reduces the risk of loss and creates a more resilient and sustainable community.

Project Overview

The counties of Alamance, Durham, and Orange, in coordination with their participating municipal jurisdictions, are preparing a **regional hazard mitigation plan** that will cover the three-county “Eno-Haw” area. The Eno-Haw Regional Hazard Mitigation Plan will identify local policies and actions for reducing risk and future losses from natural hazards such as floods, severe storms, wildfires, and winter weather. It will build upon the separate hazard mitigation plans initially prepared in each county.

The plan will also serve to meet key federal planning regulations which require local governments to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation projects.

These mitigation planning requirements stem from the Disaster Mitigation Act of 2000, which was passed by the U.S. Congress in October of 2000. This Act amended federal law to require that all states and local governments must have hazard mitigation plans in place in order to be eligible to apply for funding under such programs as the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) program.

The Planning Process

The planning process for the Eno-Haw Regional Hazard Mitigation Plan will consist of six main phases described in detail in the following sections: **public outreach, risk assessment, capability assessment, mitigation strategy development, plan maintenance, and plan adoption.** The end result will be a new regional hazard mitigation plan based in part on the existing plans of the three separate counties and their jurisdictions and based in part on this new planning effort.



Above: The plan update process being followed for the Eno-Haw Regional Hazard Mitigation Plan.

Public Outreach

The goals of the public outreach strategy for this planning effort are to: generate public interest, solicit citizen input, and engage additional partners in the planning process.

Public outreach will include two open public meetings, a project information website located at <http://www.readyorange.org>, a web-based public participation survey located at <https://www.surveymonkey.com/s/aodhazardmitigation> (also accessible through the project information website), and updates and information shared via social media, such as on Facebook and Twitter.

Risk Assessment

The desired outcomes of a risk assessment are an evaluation of each hazard's potential impacts on the people, economy, and built and natural environments in the planning area plus an understanding of each participating jurisdiction's overall vulnerability and most significant risks. These potential impacts and a thorough understanding of the overall vulnerability can be used to create problem statements and identify and prioritize mitigation actions to reduce risk.

Capability Assessment

Each participating jurisdiction has a unique set of capabilities, including authorities, policies, programs, staff, funding, and other resources available to accomplish mitigation and reduce long-term vulnerability. By reviewing the existing capabilities in each jurisdiction, the planning team can identify capabilities that currently reduce disaster losses or could be used to reduce losses in the future.

Mitigation Strategy Development

The primary purpose of mitigation planning is to systematically identify policies, actions, and activities to reduce the impact that future natural hazard occurrences will have on people and property in the planning area. Mitigation strategy development includes long-range mitigation goals common to the planning area and short-term mitigation actions specific to each participating jurisdiction.

Plan Maintenance

Plan maintenance is the process established to track the plan's implementation and to aid in updating the plan every five years. These procedures help to ensure that the mitigation strategy is implemented according to the plan. They also provide the foundation for an ongoing mitigation program, standardize long-term monitoring of hazard-related activities, integrate mitigation principles into local officials' daily job responsibilities, and maintain momentum through continued engagement and accountability in the plan's progress.

Plan Adoption

Each participating jurisdiction seeking plan approval must adopt the plan. Adoption by the local governing body demonstrates the community's commitment to implementing the mitigation strategy and authorizes responsible agencies to execute their actions. The final plan is not approved until the community adopts the plan and FEMA receives documentation of formal adoption by the governing body of the jurisdictions requesting approval.

Project Leadership

This regional planning effort is being led by Orange County Emergency Services, with technical assistance from the State of North Carolina and consulting firm AECOM. A local Hazard Mitigation Planning Team made up of local officials, representatives, and stakeholders has been established to guide this process. In addition, local points of contact have been established for each of the three counties as well as all of the participating municipal jurisdictions. Planning committee meetings and open public meetings will be scheduled to occur at key points throughout the project timeline.

Schedule

The planning process began in July 2014 and a fully updated plan is expected to be ready for review by the North Carolina Division of Emergency Management and the Federal Emergency Management Agency by February 2015. Draft documents will be available on the project information website at various stages in the planning process.

For More Information

To learn more about this project, or to find out how you can be involved, please contact Kirby Saunders, Orange County Emergency Services Coordinator, at (919) 245-6100 Ext. 6135 or ksaunders@orangecountync.gov.

Additional information and regular updates throughout the duration of this project can be found on the Eno-Haw Hazard Mitigation Planning website at <http://www.readyorange.org>.

Appendix G: Safe Growth Surveys

This appendix to the Eno-Haw Regional Hazard Mitigation Plan includes a copy of the *Safe Growth Survey* completed by the one jurisdiction that participated in this optional survey.

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AOD Regional Hazard Mitigation Plan Update

SAFE GROWTH SURVEY

This survey instrument is designed to capture some general information for purposes of updating the *AOD Regional Hazard Mitigation Plan*. It has been adapted from a technique recommended by the American Planning Association and Federal Emergency Management Agency to help evaluate the extent to which each local jurisdiction in the three-county planning area of Alamance, Durham, and Orange counties is positioned to grow safely relative to its natural hazards. These hazards include but are not limited to dam failure, droughts and heat waves, earthquakes, floods, hurricanes, landslides, thunderstorms, severe winter storms, tornadoes, and wildfires.

This survey should be completed by appropriate planning, zoning and/or community development staff for each jurisdiction participating in the hazard mitigation plan update process. If you have any questions regarding this survey or the plan update process, please contact your Local Jurisdiction Lead who is currently serving on the multi-jurisdictional Planning Team. You may also contact Kirby Saunders, Orange County Emergency Management Coordinator, at 919.245.6100 Ext. 6135 or ksaunders@orangecountync.gov.

Please provide us with the following contact information.

Name / Title:	Jerry L. Wagner, Fire Marshal / EM Coordinator
Jurisdiction:	Town of Hillsborough
Department:	Fire Marshal's Office
Phone / E-mail:	(919)241-4801 jerry.wagner@hillsboroughnc.org

Please indicate how strongly you agree or disagree with the following statements as they relate to your jurisdiction's current plans, policies and programs for guiding future community growth and development.

1 = Strongly Disagree 2 = Somewhat Disagree 3 = Neutral 4 = Somewhat Agree 5 = Strongly Agree

GENERAL PLAN	
Land Use	
1. The general plan includes a future land use map that clearly identifies natural hazard areas.	5
2. Current land use policies discourage development and/or redevelopment within natural hazard areas.	5
3. The general plan provides adequate space for expected future growth in areas located outside of natural hazard areas.	5
Transportation	
4. The transportation element limits access to natural hazard areas.	4

5. Transportation policy is used to guide future growth and development to safe locations.	4
6. Transportation systems are designed to function under disaster conditions (e.g., evacuation, mobility for fire/rescue apparatus, etc.).	3
Environmental Management	
7. Environmental features that serve to protect development from hazards (e.g., wetlands, riparian buffers, etc.) are identified and mapped.	5
8. Environmental policies encourage the preservation and restoration of protective ecosystems.	5
9. Environmental policies provide incentives to development that is located outside of protective ecosystems.	4
Public Safety	
10. The goals and policies of the general plan are related to and consistent with those in the Multi-jurisdictional Hazard Mitigation Plan.	5
11. Public safety is explicitly included in the plan's growth and development policies.	5
12. The monitoring and implementation section of the plan covers safe growth objectives.	4
ZONING ORDINANCE	
13. The zoning ordinance conforms to the general plan in terms of discouraging development and/or redevelopment within natural hazard areas.	5
14. The ordinance contains natural hazard overlay zones that set conditions for land use within such zones.	4
15. Rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use.	5
16. The ordinance prohibits development within, or filling of, wetlands, floodways, and floodplains.	4

SUBDIVISION REGULATIONS	
17. The subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas.	4
18. The regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources.	4
19. The regulations allow density transfers where hazard areas exist.	3
CAPITAL IMPROVEMENT PROGRAM AND INFRASTRUCTURE POLICIES	
20. The capital improvement program limits expenditures on projects that would encourage development and/or redevelopment in areas vulnerable to natural hazards.	4
21. Infrastructure policies limit the extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards.	3
22. The capital improvements program provides funding for hazard mitigation projects identified in the Multi-jurisdictional Hazard Mitigation Plan.	4
OTHER	
23. Small area or corridor plans recognize the need to avoid or mitigate natural hazards.	4
24. The building code contains provisions to strengthen or elevate new or substantially improved construction to withstand hazard forces.	5
25. Economic development and/or redevelopment strategies include provisions for mitigating natural hazards or otherwise enhancing social and economic resiliency to hazards.	3

Thank you for your assistance in completing this survey. Please submit a completed, scanned copy to Kirby Saunders, Orange County Emergency Management Coordinator, at ksaunders@orangecountync.gov or by fax to (919) 732-8137.

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