

II. Mitigation Action Plan

This section of the Plan summarizes study conclusions, outlines community goals and objectives, and describes the action plan to reduce the Town of Apex's vulnerability to the effects of natural hazards. Mitigation objectives are designed to support community goals while further defining the parameters for development of mitigation actions. Mitigation actions describe specific steps that are to be undertaken to achieve the stated objectives. Mitigation actions are intended to serve as benchmarks for evaluating progress on plan implementation.

A. Study Conclusions

With limited financial and staff resources to dedicate to hazard mitigation, it is essential that those hazards with the highest likelihood of occurrence and the greatest potential impact receive the highest investment of Town resources. Through hazard identification and analysis and vulnerability assessment, it has been determined that the Town of Apex is susceptible to the impact of certain natural hazards as summarized at the conclusion of Appendix A Hazard Identification and Analysis.

The Town is not at risk for coastal erosion, tsunamis, or volcanoes and that there is "low" risk of riverine erosion, dam and levee failures, earthquakes, and landslides/sinkholes, these hazards were not addressed. Six hazards were rated either "moderate" or "high" risk - droughts and heat waves; floods; hurricanes and coastal storms; severe storms and tornadoes; wildfires; and winter storms and freezes.

Moderate and High Hazard Threats

Floods

Flooding is often associated with hurricanes and coastal storms (most often general flooding) as well as with severe summer storms (typically flash flooding). Floods are the easiest hazard to quantify and isolate as flooding occurs only in known locations. The severity of a flood is generally dependent upon the amount of rainfall and prior soil conditions (including ground cover). Flood hazard vulnerability can be decreased through adoption and enforcement of local land use regulations and through cooperative, regional efforts to ensure that upstream jurisdictions are not contributing to downstream flooding problems.

High Winds (Severe Storms/Tornadoes and Hurricanes/Coastal Storms)

Severe storms and tornadoes as well as hurricanes and coastal storms present high wind hazards. This hazard is mainly combated through building codes and construction. Enforcement of the current State building code and enhancement of the code in regards to wind resistance will prove the most beneficial in addressing high winds.

Droughts and Heat Waves

In general, communities can have little influence or impact on mitigating the impact of droughts/heat waves on the local government level except through ensuring adequate water supplies for normal circumstances and through implementation of water conservation measures when drought conditions are imminent. Similarly, heat waves have wide ranging effects that are almost impossible to combat on a level government level. Communities, therefore, depend upon State and Federal agencies for assistance.

Wildfires

Fortunately, wildfires in North Carolina, although frequent, are not normally a serious threat to large areas as is the case in western states where dry weather conditions and large expanses of timber increase the likelihood and extent of the impact of a wildfire. The North Carolina Division of Forest Resources has the responsibility for protecting state and privately owned forest land from wildfires. The program is managed on a cooperative basis with all one hundred counties in the State. The State fire program emphasizes fire prevention efforts; pre-suppression activities (including extensive training of personnel); aggressive suppression efforts on all wildfires; and law enforcement follow-up.

Winter Storms and Freezes

Local governments also look to the State and to private utility companies for leadership in dealing with winter storms/freezes. The typical effects of snow and ice accumulation - loss of electrical power, phone, and cable service and treacherous road conditions - can be only minimally addressed at the local level. (The exceptions would be larger cities which have more snow/ice removal equipment and manpower and governments that own the local electrical distribution system.)

Statement of Commitment to Mitigating Impacts of Natural Hazards

Through the act of developing and adopting a Hazard Mitigation Plan, the Town of Apex is committing to develop and engage in programs, activities and practices that can be implemented at the local government level to help to mitigate the impacts of future natural hazards. The Town will place primary emphasis on and dedicate resources, as available, to mitigating the effects of flooding. Secondary emphasis will be placed, as practicable at the local level, on mitigating the effects of high winds, droughts and heat waves, wildfires, and winter storms and freezes.

B. Community Goals

The primary goal of all local governments is to promote the public health, safety, and welfare of the citizens of the community. In keeping with this standard, the Town of Apex has developed four goal statements for local hazard mitigation planning. Each goal, purposefully broad in nature, serves to establish parameters that were used in developing more specific objectives and mitigation actions. Consistent implementation of objectives and actions will over time ensure that community goals are achieved.

- Goal #1** Protect the public health, safety and welfare by increasing public awareness of hazards and by encouraging most collective and individual responsibility for mitigating hazard risks.
- Goal #2** Improve technical capability to respond to hazards and to improve the effectiveness of hazard mitigation actions.
- Goal #3** Enhance existing or create new policies and ordinances that will help reduce the damaging effects of natural hazards.
- Goal #4** Protect the most vulnerable populations, buildings, and critical facilities through the implementation of cost-effective and technically feasible mitigation actions.

C. Mitigation Objectives

Mitigation objectives are designed to support community goals while further defining parameters for development of mitigation actions. Objectives are numbered to correspond with the goal that each supports.

- Objective 1.1** The Town will engage in activities and practices that will help mitigate the impacts of natural hazards.
- Objective 1.2** The Town will, in cooperation with Wake County, implement a public awareness campaign to educate citizens of the possible hazards associated with locating in floodplains and of measures that can be taken to lessen impacts of future floods.
- Objective 1.3** The Town will work to ensure that emergency services are adequate to protect public health and safety.
- Objective 2.1** The Town will work to keep infrastructure extensions out of hazardous areas in order not to actively encourage development to occur in known hazardous areas.
- Objective 2.2** The Town will regularly monitor hazard mitigation efforts to ensure that adequate progress is being made towards stated goals.
- Objective 3.1** The Town will work to ensure future development occurs in such a way as to protect wetlands, floodplains, and other natural features that serve to reduce flood hazard susceptibility.
- Objective 3.2** The Town will increase control over development in the floodplain to prevent increases in flood velocities and levels that endanger both people and property.
- Objective 4.1** The Town will work to develop in such a way that the built environment does not occur in any known or predictable pathways of a natural hazard. If this is unavoidable, as in the case of hurricane force winds, the Town will ensure that new structures are as resilient as possible to the impacts of a natural hazard.
- Objective 4.2** The Town will work to limit development in areas that may cause emergency workers to put lives at risk to rescue someone from a structure knowingly built in a hazardous area.

D. Mitigation Actions

The Town of Apex developed the mitigation actions described in Table II-1. Many proposed actions will have a positive effect on mitigating potential damages from most if not all natural hazards. The listed actions do, however, primarily focus on ways the Town can act to lessen and, ideally, eventually prevent future flood losses from inappropriate new development.

Mitigation actions were developed and prioritized by the departmental staff responsible for implementation of the specific action. Each department categorized actions as low, moderate or high priority based on assessment of the need for the specific action, the projected cost of implementation, the potential beneficial effects from implementation of the action, and available funding sources. The implementation years – between 2004 and 2009 – were also determined by the responsible departments using projected resources (personnel, vehicles, etc.) and operating funds. As discussed under Study Conclusions, the planning team determined that some potential actions were more appropriately addressed at the State level due to long established priorities and responsibilities assumed by the State of North Carolina and local governments.

Individual staff departments were responsible for determining:

1. Cost effectiveness, i.e., do returns or savings produced by implementation of the action outweigh the cost of implementation?
2. Environmental impact, i.e., are actions designed to protect environmentally fragile areas as natural stormwater storage areas? and
3. Technical feasibility, i.e., can the action be undertaken by the Town using current staff and local funds, State, or Federal funds, or do other funding sources need to be identified?

In developing actions, the Town relied on the following six mitigation policy categories provided by FEMA:

1. Prevention (P) Measures
Preventive measures are intended to keep hazard problems from getting worse. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred or where capital improvements have not been substantial. Examples of prevention measures include:
 - (a) Comprehensive land use planning
 - (b) Zoning regulations
 - (c) Subdivision regulations
 - (d) Open space preservation
 - (e) Building code
 - (f) Floodplain development regulations
 - (g) Stormwater management
2. Property Protection (PP) Measures
Property protection measures protect existing structures by modifying the building to withstand hazardous events, or removing structures from hazardous locations. Examples of property protection measures include:
 - (a) Building relocation
 - (b) Acquisition and clearance
 - (c) Building elevation
 - (d) Barrier installation
 - (e) Building retrofit

3. **Natural Resource (NR) Protection**

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their mitigative functions. Such areas include floodplains, wetlands, and dunes. Parks, recreation or conservation agencies and organizations often implement these measures. Examples include:

 - (a) Wetland protection
 - (b) Habitat protection
 - (c) Erosion and sedimentation control
 - (d) Best management practices (BMPs)
 - (e) Stream dumping
 - (f) Forestry practices

4. **Emergency Services (ES) Measures**

Although not typically considered a mitigation technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:

 - (a) Hazard warning system
 - (b) Emergency response plan
 - (c) Critical facilities protection
 - (d) Health and safety maintenance
 - (e) Post-disaster mitigation

5. **Structural Projects (S)**

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event. The projects are usually designed by engineers and managed or maintained by public works staff. Examples include:

 - (a) Reservoirs, retention and detention basins
 - (b) Levees and floodwalls
 - (c) Channel modifications
 - (d) Channel maintenance

6. **Public Information Activities (PI) Activities**

Public information and awareness activities are used to advise residents, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques that the public can use to protect themselves and their property. Examples of measures to education and inform the public include:

 - (a) Map information
 - (b) Outreach projects
 - (c) Library
 - (d) Technical Assistance
 - (e) Real estate disclosure
 - (f) Environmental education

Table II-1 Mitigation Action Plan - Explanation of Columns

Action

Action # corresponds to FEMA mitigation policy categories listed above.

Action

Specific action to be undertaken. Where applicable, the appropriate CRS category is referenced. An explanation of CRS activities is included in Tables II-2 – II-5.

Hazard

Hazard which the action addresses.

Objective(s) Addressed

Reference to the numbered objective which the action supports.

Relative Priority

Low, moderate or high priority as determined by the responsible agency/department.

Funding Sources

State and Federal sources of funds are noted, where applicable.

Responsible Party

Staff department responsible for undertaking the action. Note: The Town Board of Commissioners has ultimate authority to approve any policy, program or regulation revisions.

Target Completion Date

Date by which the action should be completed.

Abbreviations used in Table II-1:

FEMA	Federal Emergency Management Agency
NCDENR	North Carolina Department of Environment and Natural Resources
NCDOT	North Carolina Department of Transportation
NCEM	North Carolina Division of Emergency Management
NCHP	North Carolina Highway Patrol
NPDES	National Pollutant Discharge Elimination Program
USGS	United States Geological Survey
WCEM	Wake County Emergency Management
WCS	Wake County Sheriff's Office

Town Departments

BLDG	Building Department
CM	Construction Management Department
EMS	Emergency Medical Services
FIRE	Fire Department
IT	Information Technology
MAN	Town Manager's Office
PLG	Planning Department
POL	Police Department
PR	Parks and Recreation Department
PWU	Public Works and Utilities Department

Table II-1: Town of Apex Mitigation Action Plan

Action #	Action	Hazard	Objective(s) Addressed	Relative Priority	Funding Sources	Responsible Party	Target Completion Date
Preventive (P)							
P-1	Adoption of the Comprehensive Land Use Plan that will provide a 20 year plan for the town and include goals and policies for public safety and hazard mitigation.	All	1.1	High	Local	PLG	July 2004
P-2	Land Use Plan: As town grows towards Jordan Lake, lower density and cluster development.	All	1.1	Moderate	Local	PLG	July 2004
P-3	UDO: Continue to provide stream and creek buffers, and floodplain and wetland protection.	Flood	3.1	High	Local	PLG	Ongoing
P-4	UDO: Resource Conservation Areas (RCA) – Continue to protect floodplains, streams, and creeks.	Flood	3.1	High	Local	PLG	Ongoing
P-5	UDO: Subdivision Standards – Continue to provide protection for residential areas by not allowing residential lots in the floodplain.	Flood	3.2	High	Local	PLG	Ongoing
P-6	Building Code – Ensure buildings are minimum 2' above base flood elevation.	Flood	3.2	High	Local	BLDG	Ongoing
P-7	UDO: Flood Damage Prevention Overlay District – Continue to restrict and prohibit uses which are dangerous to health, safety, and property. Uses vulnerable to floods are protected.	Flood	3.1 3.2 4.2	High	Local	PLG	Ongoing
P-8	UDO: Flood Damage Prevention – Ensure control is provided for filling, grading and dredging within floodplains by working with necessary State and Federal Agencies.	Flood	3.1 3.2	Moderate	Local	PLG CM	Ongoing
P-9	UDO: Flood Damage Prevention – prevent or regulate construction of flood barriers.	Flood	3.1 3.2	Moderate	Local	CM	Ongoing
P-10	UDO: Watershed Protection Overlay District – Ensure riparian buffers are provided for perennial and intermittent streams, lakes, and ponds.	Flood	3.1 3.2	High	Local	PLG PWU	Ongoing
P-11	UDO 7.2.1 - Streets – Ensure road standards to be maintained in disaster preparation for possible use as evacuation routes.	All	1.1	Moderate	Local	PLG	Ongoing

Action #	Action	Hazard	Objective(s) Addressed	Relative Priority	Funding Sources	Responsible Party	Target Completion Date
P-12	Provide adequate water supply through storage and interconnection with other public water systems.	Drought	1.1	Moderate	Local	PW	Ongoing
P-13	Provide adequate electric utility service through tree trimming contracts, the use of six circuits, and the construction of a new electrical substation.	All	1.1	Moderate	Local	PWU	May 2005
P-14	Provide backup power for all critical public facilities (wastewater treatment plant, sewer pump stations, Public Works and Utilities building, and other critical public buildings).	All	1.1	Moderate	Local	PWU	Ongoing
P-15	Maintain major town transportation routes through snow and ice removal contracts and equipment.	Severe Winter Storms	1.1 2.2	Moderate	Local	PWU	Ongoing
P-16	Require Engineered Storm Water Control Structures.	Flood	2.2 3.1 3.2	Moderate	Local	PWU	Ongoing
P-17	Town of Apex on a regular basis backs-up information pertaining to Town government in case of an emergency.	All	1.1 1.3 2.2	Moderate	Local	IT	Ongoing
P-18	Apex Transportation Plan – Continue to address disaster preparedness (evacuation) through road interconnectivity, paved roads, and widening of roads.	All	1.1	Moderate	Local	PLG	Ongoing
P-19	Review and update as necessary UDO Flood Damage Prevention Overlay District regulations to increase protection from flood hazard events.	Flood	3.1 3.2	Moderate	Local	PLG	Ongoing
Natural Resources (NR) Protection							
NR-1	UDO 6.1.12 – Continue to require engineered stormwater controls including stream and wetland protection.	Flood	2.2 3.1 3.2	Moderate	Local	PLG	Ongoing
NR-2	UDO 6.2 - Flood Damage Prevention Overlay District - continue to prohibit any development in floodway to protect floodplains and wetlands.	Flood	3.1 3.2	Moderate	Local	PLG	Ongoing
Emergency Services (ES) Measures							
ES-1	Ongoing provision of emergency assistance as needed.	All	1.1	High	Local	POL EMS FIRE	Ongoing

Action #	Action	Hazard	Objective(s) Addressed	Relative Priority	Funding Sources	Responsible Party	Target Completion Date
ES-2	Emergency Operations Command Post Center – established when natural hazard imminent. If needed, Center coordinates evacuations, sheltering, staging for equipment, manpower, and needed supplies. Equipment includes internet access, telephone, wireless communications, radio and backup supplied by emergency batteries and/or generators.	All	1.1 2.2	High	Local	FIRE EMS POL	Ongoing
ES-3	Ensure hazard warning methods include television, radio, internet and, if needed, emergency vehicles loud speaker systems.	All	1.1 2.2	Moderate	Local	FIRE EMS IT POL	Ongoing
ES-4	Maintain open lines of communication between all branches of emergency response personnel.	All	1.1 1.3	Moderate	Local	IT	Ongoing
ES-5	Prepare for emergency situations – weather station, local weather warning system, and emergency management.	All	1.3	Moderate	Local	FIRE	Ongoing
ES-6	Standard Operating Guidelines – collection of procedures to be followed during emergencies.	All	1.3	High	Local	FIRE	Ongoing
ES-7	Maintain contact information for local businesses in case of an emergency.	All	1.3	High	Local	FIRE	Ongoing
ES-8	Health and safety maintenance – provide assistance with security and post storm clean-up.	All	1.3	High	Local	POL	Ongoing
ES-9	Post disaster response – building inspections.	All	1.3	Moderate	Local	BLDG	Ongoing
Public Information (PI) Activities							
PI-1	Town website - public access, information pertaining to evacuation routes, emergency contact numbers, and detailed weather reports in case of emergency,	All	1.1 1.3	Moderate	Local	IT	July 2005
PI-2	Hazard Disclosure – Geographic information systems (GIS) map maintained to increase public awareness of known hazard locations.	Flood	1.1 4.2	Moderate	Local	PLG	Ongoing
PI-3	Planned park land purchase – nature park to include trails and environmental education center.	Flood	1.2	High	Local Wake County	PR	July 2008
PI-4	Public Library – Maintain and update hazard information accessible to the public.	All	1.1 1.2	Moderate	Local	PLG	January 2005
PI-5	Continue to provide flood maps for public use with staff continuing to be available for public assistance.	Flood	1.1 1.2	High	Local	PLG	Ongoing

Source: Town of Apex.