

Chapter 5 – Mitigation Strategy

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5.1 Floodplain Management Goals

5.1.1. Purpose and Basis for Goals

The Vision

The goals that guide this Mitigation Strategy for floodplain management have been developed to help achieve the City's long-range vision for flood disaster resistance and community resiliency. Ultimately, the City aims to achieve active resistance to the threats of flooding and related natural hazards to human life and property through publicly-supported mitigation actions with proven results. The City embraces a long-term commitment to reduce the exposure and risks to flooding and related hazards within its jurisdiction. The City plans to activate all of its available resources through cooperative governmental and private sector initiatives, augmenting public knowledge and awareness, and enhancing local mitigation capabilities to maximize community resiliency.

Consistency with Adopted County Plan

The vision and goals of this plan are fully consistent with the vision statement and goals set forth in the 2014 Tuscaloosa County Multi-Hazard Mitigation Plan, which has been adopted by the City of Tuscaloosa. The first five goals mirror those of the Tuscaloosa County plan, and the sixth Emergency Services Goal supplements the County goals.

5.1.2. Goals for Floodplain Management

To attain its vision, the City of Tuscaloosa hereby establishes the following goals to guide its floodplain management activities:

1. **Preventive Goal.** Manage the development of land and buildings to minimize risks of loss due to flooding and related natural hazards.
2. **Property Protection Goal.** Protect structures and their occupants and contents from the damaging effects of flooding and related natural hazards.
3. **Public Education and Awareness Goal.** Educate and inform the public about the risks of flooding and related natural hazards and the techniques available to reduce threats to life and property.

4. **Natural Resources Protection Goal.** Preserve and restore the beneficial functions of floodplains and the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.
5. **Structural Projects Goal.** Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of flooding and related natural hazards, where found to be feasible, cost effective, and environmentally suitable.
6. **Emergency Services Goal.** Improve the efficiency, timing, and effectiveness of response and recovery efforts for flooding and related natural disasters.

5.2 Review of Floodplain Management Activities

5.2.1 Review of Current CRS Floodplain Management Activities

A CRS Verification Visit was conducted on May 19, 2015 by the Insurance Services Office, Inc. (ISO) in response to a new application by the City of Tuscaloosa to participate in the Community Rating System (CRS) Program. On September 28, 2015, the ISO issued its Verification Report that documented 747 points and recommended to FEMA that the City enter the CRS Program as a class 9 community.

A summary of the ISO findings of the credit points for each of the current activities are organized according to the goals of this plan, as follows:

1. Preventive Activities.

- Activity 310 – Elevation Certificates: The Building Department maintains elevation certificates for new and substantially improved buildings. (38 points)
- Activity 320 – Map Information Service: Credit is provided for furnishing inquirers with basic flood zone information from the community's latest Flood Insurance Rate Map. The service is publicized annually and records are maintained. (30 points)
- Activity 430 – Higher Regulatory Standards: Credit is provided for enforcing regulations that require freeboard for new and substantial improvement construction, cumulative substantial improvement, and local drainage protection. Credit is also provided for the enforcement of building codes. (177 points)
- Activity 440 – Flood Data Maintenance: Credit is provided for maintaining and using overlay maps in the day to day management of the floodplain. Credit is also provided for maintaining copies of all previous FIRMs. (100 points)

- Activity 450 – Stormwater Management: The community enforces regulations for stormwater management, soil and erosion control. (84 points)
2. **Property Protection Activities**
- Activity 520 – Acquisition and Relocation: Credit is provided for acquiring and relocating 25 buildings from the community’s regulatory floodplain. (75 points)
3. **Public Education and Awareness Activities**
- Activity 330 – Outreach Projects: Credit is provided for general outreach projects that include presentations to civic organizations. Credit is also provided for targeted outreach projects to repetitive loss areas. These projects are disseminated annually. (66 points)
 - Activity 340 – Hazard Disclosure: Credit is also provided for community regulations requiring disclosure of flood hazards. Real estate agents provide a brochure advising prospective buyers about insurance and checking property flood hazards enhanced by. (13 points)
 - Activity 350 – Flood Protection Information: Documents relating to floodplain management are available in the reference section of the Tuscaloosa County Library. (7 points)
4. **Natural Resources Protection Activities**
- Activity 420 – Open Space Preservation: Credit is provided for preserving approximately 10 percent of the Special Flood Hazard Area as open space. (157 points)
5. **Structural Projects Activities**
- No credit.
6. **Emergency Services Activities**
- No credit.

5.2.2 Review Criteria

STAPLEE Review

In addition to the current activities, which have been carried forward to the Action Plan, a range of other possible activities have been reviewed for effectiveness in preventing or reducing the severity of the problems identified in *Chapter 4. - Risk Assessment*. With the exception of certain activities that are clearly not feasible or inappropriate, all of the remaining activities described here have been evaluated for

possible inclusion in the Action Plan. These include a wide range of possible activities to assure all potential alternatives have been considered.

The pros and cons of each activity have been evaluated by applying the STAPLEE method, the same method applied to the evaluation of mitigation measures in the County plan. The STAPLEE method examines social, technical, administrative, political, legal, environmental, and economic considerations and provides a ready method for rating and prioritizing each mitigation activity. To perform this evaluation, each measure must respond to many of the questions presented below for each of the areas of consideration:

Social Considerations.

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

Technical Considerations.

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

Administrative Considerations.

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

Political Considerations.

- *Political support.* Do the Mayor and City Council support the proposed measure? Does the public support the measure? Do stakeholders support the measure? What advocates might facilitate implementation of the proposal?

Legal Considerations.

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

Environmental Considerations.

- *National Environmental Policy Act (NEPA).* Will the measure be consistent with Federal NEPA criteria? How will the measure affect environmental resources, such as land, water, air, wildlife, vegetation, historic properties, archaeological sites, etc.? Can potentially adverse impacts be sufficiently mitigated through reasonable methods?
- *State and local environmental regulations.* Will the measure be in compliance with State and local environmental laws, such as flood plain management regulations, water quality standards, and wetlands protection criteria?
- *Environmental conservation goals.* Will the proposal advance the overall environmental goals and objectives of the community?

Economic Considerations.

- *Availability of funds.* Will the measure require Federal or other outside funding sources? Are local funds available? Can in-kind services reduce local obligations? What is the projected availability of required funds during the timeframe for implementation? Where funding is not apparently available, should the project still be considered but at a lower priority?
- *Benefits to be derived from the proposed measure.* Will the measure likely reduce dollar losses from property damages in the event of a hazard? To what degree?
- *Costs.* Are the costs reasonable in relation to the likely benefits? Do economic benefits to the community outweigh estimated project costs? What cost reduction alternatives might be available?

- *Economic feasibility.* Have the costs and benefits of the preferred measure been compared against other alternatives? What is the economic impact of the no-action alternative? Is this the most economically effective solution?
- *Impact on local economy.* Will the proposed measure improve local economic activities? What impact might the measure have on the tax base?
- *Economic development goals.* Will the proposal advance the overall economic goals and objectives of the community?

The STAPLEE method of evaluation also facilitates the prioritization of measures. If a measure under consideration is found to be financially feasible and has high ratings within other areas of consideration, it might be given a higher priority for implementation than measures that fell lower in the ratings. Moreover, a general economic evaluation can be performed as part of the STAPLEE method, as described above. Weighing potential economic benefits to reducing damages against costs make it possible to select among competing projects.

Especially important to the selection process is availability of funds through local, State, Federal, and private resources. Potential FEMA Hazard Mitigation Assistance (HMA) grant programs, such as FEMA’s Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Grant Program (PDM), and the Flood Mitigation Assistance (FMA) Program are sometimes available to help fund eligible projects. The City has a very successful performance record with the implementation of mitigation projects funded through all of the FEMA HMA grant programs. As new sources of funding become available through the HMA grant programs, or other sources, the priorities for implementation of select projects may need to be reevaluated.

Another consideration for evaluating alternative mitigation measures is the capability of the City to implement the measures. Appendix D “Community Mitigation Capabilities Assessment” examines select capability measures.

5.2.3 Community Mitigation Action Program of the County Plan

The activities listed in this section are those related to the mitigation of flooding and related hazards that are included in the City of Tuscaloosa Community Action Program in the 2014 Tuscaloosa County Multi-Hazard Mitigation Plan that has been adopted by the Tuscaloosa City Council. All of these activities have been considered for inclusion in the Floodplain Management Action Plan. Published as Volume II “Community Action Program” of the 2014 plan, the City’s action program lists the goals, objectives and measures to be implemented over the five year planning cycle. For each measure, the action program identifies the hazards addressed, the priority, timeline, lead responsibility for implementation, estimated cost, and funding source.

1. Preventive Activities

- Develop, adopt and implement subdivision regulations that require proper stormwater infrastructure design and construction.
- Mark depths of flooding and storm surge immediately after each event. Enter and maintain these historical records in GIS.
- Carry out detailed planning and engineering studies for sub-basins in critical flood hazard areas to determine watershed-wide solutions to flooding.
- Consider large lot size restrictions on flood prone areas designated on Flood Insurance Rate Maps.
- Evaluate additional land use restrictions within designated flood zones, such as prohibition of storage of buoyant materials, storage of hazardous materials, and restrictive development of flood ways, among others.
- Require delineation of flood plain fringe, floodways, and wetlands on all plans submitted with a permit for development within a flood plain.
- Examine regulatory options and feasibility of requiring open space areas for recreation, landscaping, and drainage controls.
- Improve flood risk assessment by documenting high water marks post event, verification of FEMA's repetitive loss inventory, and revising and updating regulatory floodplain maps.
- Review and revise, as necessary, landscaping standards for parking lots that reduce the size of impervious surfaces and encourage natural infiltration of rainwater.

2. Property Protection Activities

- Evaluate elevation and culvert sizing of existing roadways in flash flood-prone areas to ensure compliance with current standards for design year floods, and develop a program for construction upgrades as appropriate.
- Identify problem drainage areas, conduct engineering studies, evaluate feasibility, and construct drainage improvements to reduce or eliminate localized flooding.
- Elevate certain buildings in flood prone areas where acquisition or relocation is not feasible, with emphasis on pre-FIRM buildings; where feasible, elevation is preferable to flood proofing.
- Repair, elevate, and weatherize existing homes for low- to moderate-income families.
- Flood proof pre-FIRM non-residential buildings, where feasible.
- Retrofit existing buildings, critical facilities, and infrastructure against potential damages from natural and manmade hazards.
- Promote the purchase of insurance coverage by property owners and renters for flood damages in high-risk areas.

3. Public Education and Outreach Activities

- Provide technical advisory assistance to building owners on available building retrofits to protect against natural hazards damages.
- Provide technical assistance to homeowners, builders, and developers on flood protection alternatives.
- Publicize the availability of FIRM information to real estate agents, builders, developers, and homeowners through local trade publications and newspaper announcements.
- Participate in the “Turn Around Don’t Drown” program by purchasing and installing signs in known flash flood bridge overpass locations.

4. Natural Resource Protection Activities

- Promote the adoption/enforcement of storm water management regulations that maintain pre-development runoff rates.
- Develop, adopt, and implement subdivision regulations that require proper stormwater infrastructure design and construction.
- Establish an urban forestry program to help mitigate storm water runoff common in areas with large impervious surfaces.
- Increase open space acquisitions through the FEMA HMA Grant Programs and other flood plain acquisition efforts.
- Keep builders and developers informed of Federal wetlands permitting requirements of the Corps of Engineers.
- Adopt and/or enforce regulations prohibiting dumping and littering within river and stream corridors.
- Utilize technical assistance available from the Alabama Cooperative Extension System with Best Management Practices (BMP).

5. Structural Projects Activities

- Examine use of minor structural projects (small berm or floodwall) in areas that cannot be mitigated through non-structural mitigation techniques.
- Prepare and implement standard operating procedures and guidelines for drainage system maintenance.
- Construct drainage improvements to reduce or eliminate localized flooding in identified problem drainage areas.

6. Emergency Services Activities

- Perform vulnerability assessments of critical facilities to identify retrofit projects to improve the safety of occupants and mitigate damages from flooding.
- Maintain appropriate media relationships to ensure the public is informed of flood threats and means to mitigate property damages and loss of life.
- Upgrade siren-warning systems to provide complete coverage to all jurisdictions.

- Upgrade critical communications infrastructure.
- Require the installation of weather radios in all public buildings and places of public assembly.
- Distribute weather radios and emergency response instructions to municipal residents

5.2.4 Discussion of Alternative Mitigation Activities

The Floodplain Management Planning Committee (FMPC) reviewed the current activities credited under the Community Rating System (CRS) Program (see section 5.2.1 above), the activities endorsed by the City of Tuscaloosa in its Community Action Program, adopted as a component of the 2014 Tuscaloosa County, Alabama, Multi-Hazard Mitigation Plan and further evaluated a full range of alternative mitigation activities presented in this section. All of these potential mitigation activities were summarized and presented as an exercise completed by members of the FMPC and discussed at their January 19, 2016, meeting. The results of this exercise can be found in Appendix G “Alternative Mitigation Measures Exercise.” The alternatives considered for inclusion in the Floodplain Management Action Program have been grouped according to the six goal areas, noted below. These activities have been evaluated according to the STAPLEE method for appropriateness, taking into account the pros and cons of each potential mitigation activity. Further, the City’s funding and implementation capabilities have been carefully considered. A discussion of the evaluation results follows.

1. Preventive Activities

Existing Preventive Activities.

The City has a range of planning and regulatory tools available to manage development and reduce future flood losses, as discussed below. The Department of Planning and Development Services has primary responsibility for maintaining and enforcing these tools, with the support of the Office of the City Engineer.

The City has a longstanding record of active comprehensive planning. As discussed in Section 4.3.5 “Future Development and Population Trends,” comprehensive plans adopted by the City over the past decades intend to manage future growth and development throughout the City, thereby reducing future flood losses. Tuscaloosa 2020: A Consensus Strategic Plan was approved as an amendment to the City’s comprehensive plan in 2005. The comprehensive plan was later updated by the 2007 City of Tuscaloosa Citywide Future Land Use Plan. These comprehensive plans project future growth areas for residential and commercial development. The comprehensive plan identifies areas suitable for future development and floodplain and floodway development constraints. The principles laid out in these documents are still valid.

Following the April 27, 2011, tornado disaster, which devastated the City, Tuscaloosa Forward: A Strategic Community Plan to Renew and Rebuild focuses on the path of heaviest impact, which included previously developed areas within and outside the regulatory flood plains. This plan for renewal encourages greenways and sustainable design with targeted locations. The zoning and development controls enacted for redeveloping damaged properties within the affected corridor increase green infrastructure and apply strict stormwater design standards to improve pre-event hydrologic conditions.

The City administers the 2015 International Code Series of building and technical codes that establish minimum design and construction standards for all aspects of building construction. The codes are enforced through residential and commercial permitting systems and are integrated with other development controls, including floodplain management controls, through permitting systems and interdepartmental review processes.

Central to land use and development control is the Tuscaloosa Zoning Ordinance. The Zoning Ordinance lays out district land use, dimensional standards, and other development criteria in accordance with a zoning map of the land use districts. In turn, the comprehensive plan guides the mapping of zoning district. The Tuscaloosa Subdivision Regulations, work in concert with the Zoning Ordinance and other development controls to ensure minimum design and construction standard be met for major subdivisions, and the regulations set out the procedures for platting lots.

Following the 2011 tornado disaster, major amendments were made to the Zoning Ordinance, as recommended by the “Tuscaloosa Forward” planning process. New “Mixed Use Districts” and “Mixed Residential Districts” encourage sustainable and creative design practices with the targeted areas for redevelopment.

Article XII of the Tuscaloosa City Code established minimum design and construction standards for all land development activities. Enforced through its “Land Development Permit (LDP)” process, these standards include provisions for drainage, erosion and sedimentation control, and stormwater runoff quality. The drainage standards seek to maintain pre-development drainage conditions.

The Floodplain Management and Flood Damage Prevention Ordinance follows the model provisions recommended by the State NFIP Coordinator but exceeds the minimums required for participation in the NFIP. CRS Credit for 177 points is currently provided for higher regulatory standards. Credit is given for enforcing regulations that require a one foot freeboard (elevation) construction within the floodplain. Other points have been credited for cumulative substantial improvement provisions, local drainage protection, and the enforcement of building codes.

The FMPC considered many preventive options and determined that the City’s floodplain management ordinance should be amended to include additional higher

regulatory standards to further reduce potential flood losses. Among other revisions, higher regulatory standards could increase the freeboard above one foot and restrict fill. Given the extents of the flood risks identified in Chapter 4 “Risk Assessment” and projected City growth, a review of all of the development controls discussed in this section would assure a more integrated program of floodplain management.

2. Property Protection Activities

As noted in Appendix G, the FMPC considered various property protection activities. Of those activities, only the promotion of flood insurance gained full planning committee support. This activity has no additional cost and has widespread community and political support. Acquisition and relocation of flood prone properties was found to be dependent on the availability of FEMA grant funds. The City had previously completed a buyout of flood prone homes through the FEMA Hazard Mitigation Grant Program but, without the FEMA funds, the project would not have been feasible. Other activities include building retrofits and elevations. These activities require property owner initiatives without City intervention. They were also found to be inappropriate due to cost and lack of community interest.

3. Public Education and Outreach Activities

Public outreach activities are low cost and popular. The FMPC offers full support of such efforts, which is reflected in the Floodplain Management Action Plan in Section 4.3.

4. Natural Resource Protection Activities

The renewal planning and development controls emanating from the 2011 tornado recovery demonstrate the City’s support for natural resources protection. The FMPC supports continued activities to increase open space and restore the natural functions of flood plains. Increasing the minimum lot area for subdivision of floodplain lands, however, was rejected by the FMPC as lacking community and political support.

5. Structural Projects Activities

The City recognizes the benefits of comprehensive drainage system maintenance to reduce flood losses and would continue or improve upon its current practices. Furthermore, the City has continued to study problem drainage areas and identify structural remedies. The success of structural projects is best demonstrated by the success of the City’s “MST3 Drainage Improvements” project funded, in part, through FEMA’s Pre-Disaster Mitigation (PDM) grant program. The City’s match was met through its “Noah’s Ark” fund, a special bond issue to set aside funds for drainage improvement projects.

6. Emergency Services Activities

The Tuscaloosa County EMA has primary responsibility county-wide for emergency response to flooding and other natural disasters. The EMA fully endorses the use of automated gage technology to monitor and forecast flood threats. Implementation and ongoing maintenance of such technology, however, can be very costly, which is a major concern. More feasible alternatives within current operating budget levels include the strengthening of emergency response planning and operations and improving coordination with critical facility operators. Both of these activities have been recommended by the FMPC for the Floodplain Management Action Plan in Section 4.3.

5.3 Floodplain Management Action Plan

This section presents the Floodplain Management Action Plan recommended by the Floodplain Management Planning Committee and adopted by the Tuscaloosa City Council. This Action Plan is the culmination of the planning process and schedules implementation of the listed measures over the next five year planning cycle ending on December 31, 2020. The Action Plan is continually reviewed for progress towards implementation and may be updated and amended from time-to-time, in accordance with Chapter 6 “Plan Maintenance Procedures.”

The following key explains the components of the Action Plan:

Key

- *“Mitigation Actions by Goal Area and Objective.”* Each mitigation action has been grouped according to the six long-term planning goals. Within each goal area, the actions have been organized according to plan objectives.
- *“Implementation Responsibility.”* This action plan assigns lead responsibility for implementation to a specific department or agency or position within the organization.
- *“Timeframe for Completion.”* Timeframes are *Short-Range* (less than 2 years), *Mid-Range* (2-3years), *Long-Range* (more than 3 years) or *Ongoing*.
- *“Funding Source(s).”* Potential funding sources are identified. FEMA Hazard Mitigation Assistance (HMA) grant programs, where noted, include the Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation (PDM) grant, and Flood Mitigation Assistance (FMA) grants. These are possible funding sources but are subject to final eligibility determination, including, among other eligibility criteria, a positive benefit/cost analysis and the availability of funds.
- *“Priority.”* Priorities are *High, Medium, and Low*.
- *“TBD”* is to be determined.

Table 5-1. 2015-2020 Floodplain Management Action Plan

#	Mitigation Actions by Goal Area and Objective	Implementation Responsibility	Timeframe for Completion	Funding Source	Priority
1	Goal for Prevention. Manage the development of land and buildings to minimize risks of loss due to flooding and related natural hazards.				
1.1	Elevation Certificates. Maintain FEMA Elevation Certificates for buildings in the floodplain.				
1.1.1	Continue to maintain FEMA Elevation Certificates for all new construction, substantial improvements, and additions to existing buildings in the floodplain.	Office of the City Engineer	Ongoing	Existing City funds	High
1.1.2	To the furthest possible extent, maintain FEMA elevation certificates for all existing buildings in the floodplain, including all "post-FIRM" buildings constructed since the City entered the NFIP in 1973 and pre-FIRM buildings prior to 1973.	Office of the City Engineer	Ongoing	Existing City funds	Low
1.2	Floodplain Mapping. Keep accurate and current floodplain maps and data used for regulatory purposes.				
1.2.1	Develop new flood elevations, floodway delineations, and other regulatory flood hazard data for areas not mapped in detail by the most recent NFIP Flood Insurance Study (FIS).	Office of the City Engineer	Ongoing	TBD	High
1.3	Higher Regulatory Standards. Establish regulatory standards that exceed the NFIP minimums.				
1.3.1	Consider freeboard of more than one foot for minimum flood protection elevation.	Office of the City Engineer	Mid-Range	Existing City funds	Medium
1.3.2	Prohibit all new buildings and substantial improvements and additions to existing buildings in the floodway.	Office of the City Engineer	Mid-Range	Existing City funds	Medium
1.3.3	Protect critical facilities (police, fire, public utilities, schools, medical, etc.) to the 500 year flood elevation.	Office of the City Engineer	Mid-Range	Existing City funds	Medium
1.3.4	Consider requiring compensatory storage for fill.	Office of the City Engineer	Mid-Range	Existing City funds	Medium
1.3.5	Require elevation of hazardous materials storage indoors.	Office of the City Engineer	Mid-Range	Existing City funds	Medium
1.3.6	Maintain Certified Floodplain Managers (CFM) on staff for ordinance administration.	Office of the City Engineer	Ongoing	Existing City funds	High
1.4	Flood Data Maintenance. Maintain essential field data for floodplain management.				

CHAPTER 5

2015 City of Tuscaloosa Floodplain Management Plan

#	Mitigation Actions by Goal Area and Objective	Implementation Responsibility	Timeframe for Completion	Funding Source	Priority
1.4.1	Maintain elevation reference marks.	Office of the City Engineer	Ongoing	Existing City funds	Low
1.5	Stormwater Management. Effectively manage stormwater to maintain water quality and minimize flooding.				
1.5.1	Continue to maintain stormwater management standards (design storm and size of development) for the regulation of new development to ensure that post-development peak runoff is no worse than pre-development conditions.	Office of the City Engineer	Ongoing	Existing City funds	High
1.5.2	Enact regulations to require the implementation of low impact development (LID) techniques to minimize the need for more traditional stormwater management controls (pipes, channels, and detention).	Office of the City Engineer	Long-Range	Existing City funds	Low
1.5.3	Continue to regulate new construction to protect or improve water quality.	Office of the City Engineer	Ongoing	Existing City funds	High
2	<u>Property Protection Goal.</u> Protect structures and their occupants and contents from the damaging effects of flooding and related natural hazards.				
2.1	Acquisition and Relocation. Remove flood-threatened buildings from high risk flood locations.				
2.1.1	Acquire and demolish flood-prone buildings and maintain the property as permanent open space.	Office of the City Engineer	Long-Range	FEMA HMA Grants	Low
2.2	Flood Insurance Promotion. Promote the purchase of flood insurance, especially for high risk properties in the flood plain.				
2.2.1	Perform a flood insurance coverage assessment of the City's current level of coverage and identify shortcomings.	TBD	Long-Range	TBD	Low
2.2.2	Prepare and implement a coverage improvement plan under the direction of a committee of local lenders and insurance agents.	TBD	Long-Range	TBD	Low
3	<u>Public Education and Awareness Goal.</u> Educate and inform the public about the risks of flooding and related natural hazards and the techniques available to reduce threats to life and property.				
3.1	Map Information Service. Provide flood map information to the public.				
3.1.1	Continue to provide Flood Insurance Rate Map (FIRM) information to people who inquire, and publicize this service.	Office of the City Engineer	Ongoing	Existing City funds	High
3.2	Outreach Projects. Regularly perform public outreach and education programs to inform the public of flood risks and mitigation alternatives.				

#	Mitigation Actions by Goal Area and Objective	Implementation Responsibility	Timeframe for Completion	Funding Source	Priority
3.2.1	Send information about the flood hazard, flood insurance, flood protection measures, and/or the natural and beneficial functions of floodplains to residents.	Office of the City Engineer	Ongoing	Existing City funds	Medium
3.2.2	Participate in the Tuscaloosa County EMA's annual "Be Ready Day" event by distributing information to the public on flood hazard mitigation	Office of the City Engineer	Ongoing	Existing City funds	High
3.3	Hazard Disclosure. Take steps to inform the public of flood hazards.				
3.3.1	Encourage real estate agents to advise potential purchasers of flood-prone property about the flood hazard.	Office of the City Engineer	Ongoing	Existing City funds	High
3.3.2	Support the National Weather Service/Tuscaloosa County EMA "Turn Around Don't Drown" program by installing signs at hazardous bridge crossings	Office of the City Engineer	Long-Range	TBD	Medium
3.4	Flood Protection Information. Distribute flood protection information to the general public.				
3.4.1	Maintain publications and reference materials at public libraries.	Office of the City Engineer	Ongoing	Existing City funds	High
3.4.2	Create a community's website to disseminate flood protection information to the public.	Office of the City Engineer	Mid-Range	TBD	Medium
3.5	Flood Protection Assistance. Provide technical guidance for protection of buildings from flood damage.				
3.5.1	Give inquiring property owners technical advice on how to protect their buildings from flooding, and publicize this service.	Office of the City Engineer	Ongoing	Existing City funds	Medium
4	Natural Resources Protection Goal. Preserve and restore the beneficial functions of floodplains and the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community.				
4.1	Open Space Preservation. Preserve open space to restore the natural functions of the flood plain, where feasible.				
4.1.1	Preserve City-owned floodplain lands as permanent open space, kept free from development through deed restrictions.	Office of the City Attorney	Long-Range	TBD	Low
4.1.2	To the extent possible, maintain or restore City-owned flood plains to their natural condition.	TBD	Long-Range	TBD	Low
4.1.3	Provide zoning and subdivision incentives to set aside flood plains as permanent open space in new developments. Consider provisions for clustering and conservation subdivisions.	Planning & Development Services	Mid-Range	Existing City funds	Medium

#	Mitigation Actions by Goal Area and Objective	Implementation Responsibility	Timeframe for Completion	Funding Source	Priority
5	<i>Structural Projects Goal. Apply engineered structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of flooding and related natural hazards, where found to be feasible, cost effective, and environmentally suitable.</i>				
5.1	Drainage System Maintenance. Maintain natural and manmade drainage systems to effectively discharge stormwater and reduce flooding.				
5.1.1	Conduct regular inspections and maintenance of all channels and conveyance facilities and remove debris as needed.	TDOT	Ongoing	Existing City funds	High
5.1.2	Regularly inspect all detention and retention facilities constructed pursuant to the City's stormwater management regulations and all city-owned facilities to ensure proper functioning.	TDOT	Ongoing	Existing City funds	High
5.1.3	Maintain a comprehensive GIS inventory of the conveyance system and storage basins.	Office of the City Engineer	Long-Range	TBD	Medium
5.1.4	Establish an annual capital improvements programming process for drainage system improvements.	Office of the City Engineer	Ongoing	Existing City funds	High
5.1.5	Enact and publicize no stream dumping regulations.	Office of the City Attorney	Mid-Range	Existing City funds	Low
5.2	Flood Protection. Implement structural improvements where deemed effective to reduce flooding.				
5.2.1	Continue to perform engineering studies that evaluate the feasibility of structural flood controls.	Office of the City Engineer	Ongoing	Existing City funds	High
5.2.2	Protect existing floodplain development by structural projects, where deemed feasible.	Office of the City Engineer	Ongoing	City Bond Funds/FEMA HMA Grants	High
6	<i>Emergency Services Goal. Improve the efficiency, timing, and effectiveness of response and recovery efforts for flooding and related natural disasters.</i>				
6.1	Flood Warning and Response. Apply advanced technological systems to monitor flood threats and warn the public.				
6.1.1	Establish an automated flood threat recognition and forecasting system to identify impending floods.	Office of the City Engineer	Long-Range	TBD	Low
6.1.2	Establish methods for early flood warnings to the public.	Tuscaloosa County EMA	Long-Range	Existing funds	Medium
6.1.3	Develop a detailed flood response operations plan keyed to flood forecasts for City Council adoption.	Tuscaloosa County EMA	Mid-Range	TBD	Medium

#	Mitigation Actions by Goal Area and Objective	Implementation Responsibility	Timeframe for Completion	Funding Source	Priority
6.1.4	Coordinate flood warning and response activities with critical facilities operators.	Tuscaloosa County EMA	Ongoing	Existing funds	High

