

LAND USE PLANNING FOR HAZARD MITIGATION

**Community Report for Carroll County and the Municipalities
of Bowden, Carrollton, Mount Zion, Roopville, Temple, Villa
Rica and Whitesburg**



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ACKNOWLEDGEMENTS PAGE

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INTRODUCTION

In 2008 a presidential disaster declaration included 20 Georgia counties and 87 Georgia cities that were impacted by severe storms, tornadoes and flooding. To assist these counties and cities with their ability to prepare for future hazards and to be more disaster resilient by limiting the interruption of the hazards on the local community, the Georgia Department of Community Affairs (DCA) conducted a comparative analysis and assessment of the affected communities' 5-year hazard mitigation plans and 20-year local land use plans (comprehensive plans). Applicable regional plans were also evaluated.

Results of the analyses for each county are presented in Community Reports. Each report provides a framework for understanding the benefits of coordinating land use planning with hazard mitigation planning, and is organized into the following sections:

1. How To: Principles for Integration of Land Use Planning and Hazard Mitigation Planning
2. Key Findings: Comparative Plan Analysis
3. Recommendations: Next Steps for Your Community and Regional Commission

This Community Report specifically addresses Carroll County and the municipalities of Bowden, Carrollton, Mount Zion, Roopville, Temple, Villa Rica and Whitesburg. Carroll County and these municipalities are member jurisdictions of the Three Rivers Regional Commission (TRRC).

2008 PRESIDENTIAL DISASTER DECLARATION

SEVERE STORMS AND TORNADOES

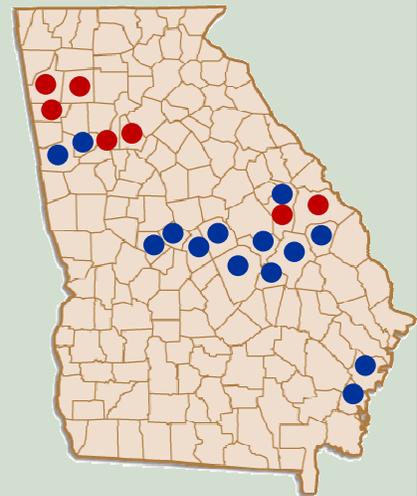
● Counties:

Bartow, Burke, DeKalb, Floyd, Fulton, Jefferson, Polk

SEVERE STORMS AND FLOODING

● Counties:

Bibb, Carroll, Crawford, Douglas, Emanuel, Glynn, Jefferson, Jenkins, Johnson, Laurens, McIntosh, Treutlen, Twiggs, Wilkinson



HOW TO: PRINCIPLES FOR INTEGRATING LAND USE PLANNING AND HAZARD MITIGATION PLANNING

The Role of Local Plans

Most communities in Georgia have an approved hazard mitigation plan in compliance with the requirements of the *Robert T. Stafford Disaster Relief and Emergency Assistance Act*, as amended by the Disaster Mitigation Act of 2000 (DMA). An approved hazard mitigation plan under these regulations ensures a community's continued eligibility for federal pre- and post-disaster assistance.

Most communities in Georgia also have an adopted comprehensive land use plan that complies with DCA guidelines, as well as environmental regulations, zoning regulations and/or land development regulations that implement land use policies. These policies and ordinances are typically enacted to address a wide range of issues including those related to quality of life and economic development. But they can also play an important role in a community's preparedness for natural disasters.

The local planners and others who author comprehensive plans are typically less involved in hazard mitigation planning than comprehensive planning, if they are involved at all. This common gap in coordinated planning can limit a community's ability to fully analyze and reduce risks associated with disasters. Coordinated planning is needed to ensure consistency among local plans, policies and programs. In particular, a comprehensive plan's goals, policies and recommendations should relate to those of the hazard mitigation plan for the community.

Participation by emergency managers, floodplain managers, engineers and planners in planning processes can benefit both hazard mitigation plans and comprehensive plans by strengthening the relationship between the two. A hazard mitigation plan can identify existing vulnerabilities and the preparedness of suitable response and recovery operations in the near term, while a comprehensive plan affords an opportunity to

DEFINITION: HAZARD MITIGATION

The Federal Emergency Management Agency (FEMA) defines mitigation as “the effort to reduce loss of life and property by lessening the impact of disasters.” This is achieved through *risk analysis* (mapping, hazard mitigation plans), *risk reduction* (land use and building practices, regulations and mitigation practices) and *risk insurance* (flood insurance).

<http://www.fema.gov/mitigation#l>

The Code of Federal Regulation defines Hazard Mitigation as “any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.” (44 CFR 201.2)

mitigate longer-term risks by promoting suitable development patterns.

Public Participation in the Planning Process

There is an opportunity for local government officials, planners and emergency managers to leverage the common values of improving community safety and reducing losses of life and property by applying these values to both comprehensive planning and hazard mitigation planning. The public dialogue should be started before disasters strike. Informing the public about the importance of hazard mitigation in a pre-disaster setting can be accomplished through effective public outreach and education.

Engaging citizens, stakeholders, regional agencies and state agencies is a requirement of the DMA planning process. Most comprehensive planning processes involve the types of public meetings and participation activities that can also contribute to the hazard mitigation planning process.

To broaden the extent of public input for hazard mitigation planning, public participation programs for comprehensive plans (and any other plans with hazard-related land use implications) should include community discussions about natural hazards. In many communities, a land use planning process, such as an update to a local comprehensive plan or a neighborhood area plan, is more interesting and visible to the public than the hazard mitigation planning process, and can therefore generate additional public input beneficial to hazard mitigation planning.

Planning Cycles & Plan Updates

Hazard mitigation plans must be updated every five years for communities to remain eligible for federal pre- and post-disaster assistance. Local governments must also prepare, adopt, maintain, and implement a comprehensive plan in order to maintain qualified local government certification, and thereby remain eligible for selected state funding and permitting programs.

According to DCA's Minimum Standards and Procedures for Local Comprehensive Planning (Chapter

WHO SHOULD BE INVOLVED?

Planners / Zoning
Administrators

Emergency Managers

Elected Officials

City or County Manager /
Administrator

Planning Commission Members

Building Officials

Fire Officials

Floodplain Managers

Public Works Employees

Parks and Recreation
Employees

Transportation Planners and
Engineers

GIS Managers

Environmental Officials

Economic Development
Officials

Business Leaders / Developers

Public Information Officers

Citizens

Non-Profit Agencies

State and Federal Agencies

Academia

110-12-1, Effective January 1, 2013), local governments are required to prepare either annual or five year updates to the comprehensive plan's Community Work Program (CWP, previously called the Short-Term Work Program in the 2005 Minimum Standards and Procedures) and five-year updates to the following plan elements: Needs and Opportunities, CWP, and Land Use. Hazard Mitigation is an optional element that is not identified in the standards but is appropriate for a community to consider including.

In order to remain eligible for state funding programs, each Regional Commission must prepare, adopt, maintain, and implement a regional plan. In accordance with DCA's Standards and Procedures for Regional Planning ("Regional Planning Requirements," Chapter 100-12-6, Effective July 1, 2009), a regional plan is required to be updated every five years. In addition, annual updates to the five-year Regional Work Program are required. The annual update also facilitates policy or mapping adjustments that may be needed to address hazard mitigation.

The established deadlines for updating Carroll County's comprehensive and hazard mitigation plans do not align (see table at right). It is advisable that Carroll County and its municipalities work with the TRRC and DCA to align the plan update deadlines. This will allow the principles of hazard mitigation planning and land use planning to more easily be addressed in a coordinated planning process.

In the near-term, the upcoming required updates to the CWP element of the comprehensive plan (for Carroll County and Carrollton, Mount Zion, Roopville and Villa Rica) provide opportunities to identify common goals that are supported by the comprehensive and hazard mitigation plans.

The CWP is the comprehensive plan's implementation program that lists the specific actions to be undertaken annually by the local government over five years. When preparing the CWP update, community leaders can pull action items from the hazard mitigation plan and include them in the CWP. Supporting action items can also be amended into the CWP, such as:

- "Review comprehensive plan goals, objectives and policies to identify those that relate to hazard

**PLAN RECERTIFICATION DEADLINES:
CARROLL COUNTY, BOWDEN, CARROLLTON,
MOUNT ZION, ROOPVILLE, TEMPLE, VILLA
RICA & WHITESBURG**

County Hazard Mitigation Plan:

August 2016

Short-Term Work Program/
Community Work Program:

October 2013 (all jurisdictions except Bowden, Temple and Whitesburg)

Local Comprehensive Plan:

October 2014 (Bowdon, Temple and Whitesburg)

October 2018 (Carroll County, Carrollton, Mount Zion, Roopville and Villa Rica)

mitigation (e.g. future development, natural resource protection, community facilities and services, and transportation)”

- “Include or incorporate by reference the County’s hazard mitigation plan in future updates to the comprehensive plan”
- “Include Hazard Mitigation element in future comprehensive plan update”
- “Coordinate with the County Emergency Management Agency on the development of the hazard mitigation plan update, anticipated for 2016”

For Bowdon, Temple and Whitesburg, the 2014 comprehensive plan update provides an opportunity to implement the first three action items listed above (beginning on page 4).

Mapping Makes a Difference

Floodplain Mapping

The detail and quality of the maps in hazard mitigation plans and comprehensive plans is an important factor in effectively demonstrating potential dangers to homes, businesses and critical facilities. This is especially true for floodplain mapping, where depth grids can indicate the potential depth of water on an individual property (see Figure 1), offering greater detail and information about potential risk. At a minimum, a community’s current Flood Insurance Rate Map (FIRM) should be used in hazard mitigation planning and comprehensive planning to depict floodplains, ideally with parcels and major roads also shown on the map. The FIRM identifies Special Flood Hazard Areas (SFHA), which are the areas that would be covered by waters of the base flood (“100-year flood” or “1 percent annual chance flood”).

Historical Mapping

Historical mapping can give a perspective on how development can be impacted by future events. In hazard mitigation planning, it is common practice to include maps showing reported tornado event tracks and to factor this historic information into analysis and recommendations. Consideration of this type of

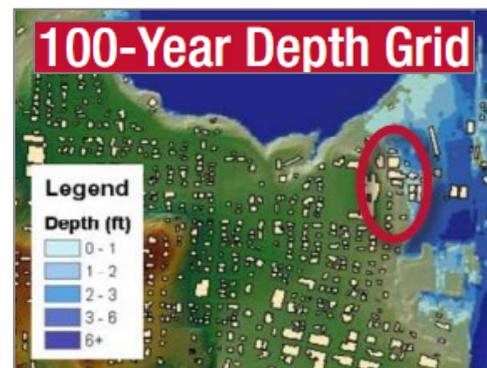


Figure 1. Example of Use of Depth Grids in Floodplain Mapping (not Carroll County)

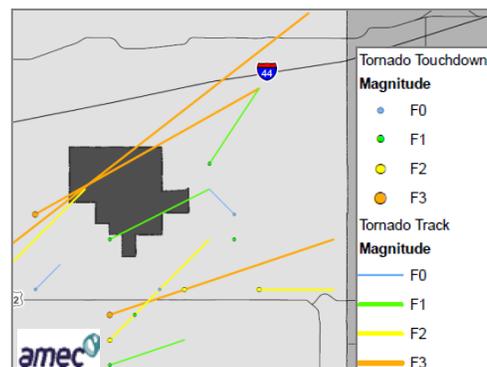


Figure 2. Example of Tornado Touchdowns and Paths Mapping (not Carroll County)

information in comprehensive land use planning could result in land use recommendations that would lead a community to become more disaster resilient (see definition at right). Figure 2 shows an example of tornado touchdowns and paths mapping.

Hazus-MH Mapping

In recognition of the importance of planning in mitigation activities, the Federal Emergency Management Agency (FEMA) developed the Hazards-United States Multi-Hazards (Hazus-MH) tool. It is a powerful disaster risk assessment tool based on geographic information systems (GIS). This tool enables communities of all sizes to predict estimated losses from floods, hurricanes, earthquakes, and other natural disasters and also to measure the beneficial impact of various mitigation practices that might help reduce those losses.

In 2012, DCA partnered with The Polis Center at Indiana University-Purdue University Indianapolis (IUPUI) to develop detailed risk assessments using Hazus-MH. The assessments are focused on defining risk from hurricanes, riverine floods, coastal floods and tornados. They will identify the characteristics and potential consequences of a natural disaster, show how much of the community could be affected, and estimate the potential for damage to community assets. These reports can be used for hazard mitigation planning by identifying strategies for protection of existing buildings and infrastructure, and also by providing information to support future development decisions, ultimately enhancing local communities' ability to be disaster resilient.

DCA plans to provide three reports to each of the 20 counties in the 2008 Presidential Disaster Declaration free of charge. These will include:

1. A multi hazard risk assessment supplement report (based on a Hazus-MH Level 2 study of the County that incorporates local inventories of buildings, essential facilities and other infrastructure)
2. The Hazus-MH Level 2 dataset, with the analysis and reports that were used to produce the multi hazard risk assessment report

DEFINITION: DISASTER RESILIENT

The Community and Regional Resilience Institute (CARRI) defines a disaster resilient community as one that is able to: *effectively prepare for, respond to, and successfully recover from a manmade or natural disaster, by having the ability to quickly:*

- *Return citizens to work*
- *Reopen schools and businesses*
- *Restore the essential services needed for a full and swift economic and social recovery*

<http://www.ResilientUs.org>

3. An existing land use map “conflicts report” showing where developed areas overlap with FEMA-designated Special Flood Hazard Areas (see also “Existing Land Use Mapping” on p. 7)

Each community is strongly encouraged to work with state and federal initiatives to produce more detailed risk assessments for their hazard mitigation plans.

Existing Land Use Mapping

Under the new DCA minimum planning standards, effective January 1, 2013, comprehensive plans are not required to include an existing land use (ELU) map. An ELU map is an important tool for hazard mitigation planning. Communities are encouraged to maintain an ELU map that can be used in both comprehensive and hazard mitigation planning, and DCA can provide an alternative suitable map to communities that have limited staff or technical resources with an alternative suitable map. Specifically, DCA can download a county’s WinGAP tax database into Hazus to produce a parcel-based land use map and a local building stock map (based on county-provided “essential facilities” data that are incorporated into the Hazus Level 2 database). The resulting map can provide accurate information for risk assessment.

Future Land Use/Development Mapping

Informed land use planning should give consideration to potential natural hazards. Land use plans that encourage development in areas that can be at risk of flood damage may be compromising hazard mitigation efforts. When this is the case, it is an indication that planning for future development has not taken into account the potential impacts of natural hazards. Addition of a “Special Flood Hazard Area” or “Floodplain” category on future land use/development maps can highlight areas not suitable for certain types of development (see Figure 3).

Many hazard mitigation plans also do not effectively incorporate land use mapping. Coordination of land use mapping and potential natural hazards analysis is critical to reducing damage and making communities more disaster resilient. This coordination can be achieved by preparing hazard mitigation and comprehensive plan updates at the same time to ensure mapping consistency.

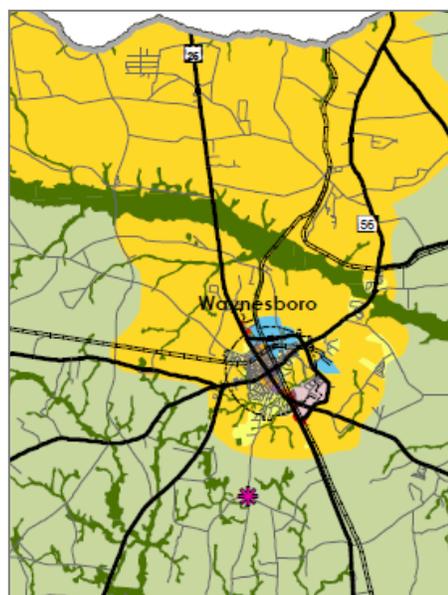


Figure 3. An example of a Future Development Map that includes the floodplain as a character area category (shown in dark green)

If plan updates occur at different times, it is important to include the most recent version of the community's future land use/development map in the hazard mitigation planning process.

Integration: Tools & Techniques

A variety of tools and techniques can be used to link hazard mitigation planning and land use planning. Successful approaches can include:

- Establish complementary goals, policies and recommendations in hazard mitigation plans and comprehensive plans (e.g. land use, natural resource protection/environmental management, transportation, public safety, etc.)
- Implement hazard mitigation recommendations/objectives through capital improvement programs and policies (e.g. water/sewer line extension, construction of public facilities) and development regulations (e.g. zoning ordinance, subdivision regulations, building and housing codes)
- Compile, maintain and share current data, trends and maps (e.g. demographic data, growth trends, development patterns, existing land use and future development maps, environmental/natural hazard maps, critical facility and infrastructure maps, etc.)
- Use the hazard mitigation plan and comprehensive plan to promote a strong culture of preparedness and mitigation
- Use state and federal laws such as the Disaster Mitigation Act of 2000 and other provisions of the Stafford Act, and state planning and zoning enabling laws as leverage while focusing on community need
- Employ proactive and coordinated outreach and stakeholder involvement in planning processes
- Insert hazard mitigation plan action items into the STWP/CWP of the comprehensive plan
- Include a “Special Flood Hazard Area” or “Floodplain” character area/land use category in future land use plans
- Coordinate with the Regional Commission and DCA to align plan update deadlines for hazard mitigation plans and comprehensive plans
- Include a Hazard Mitigation element in a future comprehensive plan update
- Integrate hazard mitigation plans with other local plans, which can include:
 - Area Plans - also known as subarea, small area, sector, or character area plans, they focus on specific parts of a community like a downtown business district, neighborhood or traffic corridor
 - Functional Plans - focus on particular community services or functions, such as sewer and water, transit, parks and recreation, or stormwater management
 - Operational Plans – focus on procedural protocols such as emergency operations or continuity of operations for government agencies

KEY FINDINGS: CARROLL COUNTY

The Hazard Mitigation Planning Analysis table on the following page is an assessment of how the current hazard mitigation plan, comprehensive plans (individual plans for the County and each municipality) and regional plan address topics that are required by FEMA to be included in a hazard mitigation plan. Recommendations pertaining to each topic identified as an “opportunity for improvement” are provided in the next section.

It should be noted that DCA minimum planning standards do not require local and regional comprehensive plans to identify and discuss some important topics in the context of hazard mitigation: *Hazard Identification*, *Critical Facilities*, and *Infrastructure and Utilities*. Local comprehensive plans and regional plans are also not required to specifically address *Review of Mitigation Measures*. As such, the local comprehensive plans and regional plans may not address a required hazard mitigation topic at all, or the plans may provide information on a topic that meets or exceeds comprehensive planning requirements but lacks sufficient detail when compared to hazard mitigation planning requirements. This issue is reflected in Table I on the following page, which indicates the level of detail provided in each plan relative to FEMA’s hazard mitigation planning requirements. Topics where the level of detail in two or more plans is low are identified as providing an opportunity for improvement and are further described in this section.

HAZARD MITIGATION PLANNING ANALYSIS OVERVIEW

Methodology:

The analysis identifies linkages and disconnects between county hazard mitigation plans prepared under the FEMA Disaster Mitigation Act (DMA) planning requirements and local and regional comprehensive plans prepared under DCA standards and procedures for planning.

Outcome:

Recommendations for the communities and regional commission to consider as they engage in future planning efforts.

Table I Hazard Mitigation Planning Analysis

Topic	Level of Detail			Comments	Opportunity for Improvement
	Hazard Mitigation Plan	County & Cities Comprehensive Plans	Regional Plan		
Hazard Mapping ¹	Low	Low	Low	The hazard mitigation plan and local comprehensive plans include GIS-based 100-year floodplain maps which are not the official FIRM. Maps show some roads but they are not parcel based. The regional plan's Regionally Important Resource Map does not delineate the 100-year floodplain map. No other hazard mapping was included in any of the three types of plans.	✓ See p. 12
Hazard Identification	Medium	Low	Low	The hazard mitigation plan has a more robust discussion of the flood hazards; it discusses tornado, severe storm and repetitive loss. The local and regional comprehensive plans provide a description of the floodplain areas and don't include a discussion of other hazards.	✓ See pp. 12-13
Land Use Mapping ²	Low	Medium	Low	The hazard mitigation plan does not address future land use mapping. Local comprehensive plans include future land use maps, with greater detail provided in the county map (including a "conservation" category that includes the floodplain). Floodplains are not mapped in the cities' maps. The regional plan maps generalized "projected development patterns" for the region; floodplains are not mapped.	✓ See p. 14
Land Use Discussion	Low	Medium	Medium	The hazard mitigation plan does not discuss future land use. Existing and future land use/development is discussed in the local comprehensive plans. The regional comprehensive plan addresses historical and projected development patterns.	
Critical Facilities Definition & List	Low	Low	Low	Critical facilities are not defined in any of the plans. The local hazard mitigation plan includes a list of critical facilities. The local and regional comprehensive plans provide lists of community facilities, which in some cases can be classified as critical facilities.	✓ See pp. 14-15
Infrastructure & Utilities Definition & List	Low	Low	Low	There is no definition for infrastructure and utilities in any of the plans. The hazard mitigation plan does not include a list. The local and regional comprehensive plans generally address the transportation network and the availability of primary utilities, but they do not describe or define infrastructure/utilities that could be impacted by natural hazards.	✓ See pp. 14-15
Planning Process Discussion (timeframe, no. of meetings & use of media)	High	High	High	All plans summarize the planning process and provide details about timeframe/project schedule, the number of meetings and use of public media to educate and involve the public.	

Topic	Level of Detail			Comments	Opportunity for Improvement
	Hazard Mitigation Plan	County & Cities Comprehensive Plans	Regional Plan		
Planning Process Participants	High	High	High	All plans provide a detailed discussion of planning process participants.	
Review of Mitigation Measures	Low	Low	Low	All three plans excluded a comprehensive discussion of mitigation measures and why certain approaches might be better than others to address natural hazards and promote mitigation.	✓ See pp. 15-17
Vulnerable Population, Economy/Tax Base & Cultural/Historic Resources Discussion	Medium	High	Medium	The local comprehensive plans address all of the categories. The hazard mitigation plan and regional plan address the topics to a lesser extent.	

¹ Hazard mapping detail is categorized with respect to the potential to provide estimates of exposure and losses to flood risks, as follows:

- High Detail – parcel based, shows comprehensive road network, includes official FIRM
- Medium Detail – not parcel based, shows comprehensive road network, includes official FIRM
- Low Detail – not parcel based, does not show comprehensive road network, does not include official FIRM

² Land use mapping detail is categorized with respect to the Future Land Use / Future Development Map’s potential to provide estimates of exposure and losses to flood risks, as follows:

- High Detail – parcel based, shows comprehensive road network, includes Special Flood Hazard Area or Floodplain category
- Medium Detail – not parcel based, shows comprehensive road network, includes Special Flood Hazard Area or Floodplain category
- Low Detail – not parcel based, does not show comprehensive road network, does not include Special Flood Hazard Area or Floodplain category

RECOMMENDATIONS: NEXT STEPS FOR YOUR COMMUNITY & REGIONAL COMMISSION

Hazard Mapping

Improved hazard mapping should be a primary focus for both hazard mitigation and comprehensive planning. More detailed floodplain mapping will increase public awareness of the dangers of living within or close to a Special Flood Hazard Area. Methods to achieve better mapping in local comprehensive plans and hazard mitigation plans include showing roads and parcel boundaries as overlays on floodplains, as well as generating depth grids that show property owners the potential depth of floodwaters on their property. Participation in FEMA’s Hazus Program is another way to achieve more robust hazard mapping. Additional detail can be found in the “Mapping Makes a Difference” section of this report, beginning on page 5.

At the regional planning level, floodplains should be delineated on the Regionally Important Resources Map. This map is used to develop the “Conservation” category in the regional plan’s Regional Development Map.

DCA can assist the County and its municipalities with hazard mapping.

Hazard Identification

When preparing an update to the comprehensive plan, Carroll County and its municipalities should incorporate discussion of natural hazards that are addressed in the hazard mitigation plan. Discussion about natural hazards should occur in public meetings conducted during the planning process, and results should be reflected in the plan itself, either in the Needs and Opportunities section or by the addition of a Hazard Mitigation element. The hazard identification process brings forth an awareness of the impact natural hazards pose to the health, safety and welfare of the community. Bringing hazard mitigation into the comprehensive planning process can contribute to recommendations and policies that will result in more disaster resilient communities.

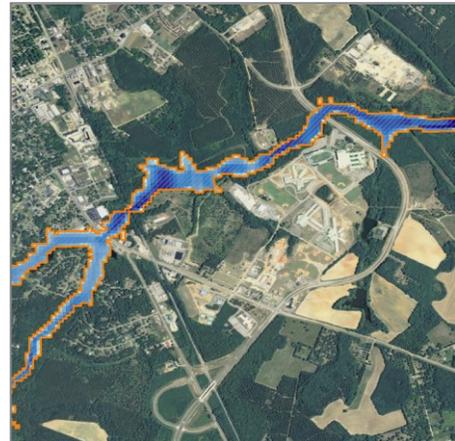


Figure 4. DCA can generate flood depth grids to illustrate the potential extent of flooding in a community



Figure 5. FEMA’s Risk MAP (Mapping, Assessment & Planning) lifecycle illustrates the process of identifying risks by utilizing flood hazard mapping and data

The regional plan's Implementation Program provides an opportunity to establish policies and performance standards that address identified hazards. An example of a regional policy that can be used by any local government in decision-making would be a statement such as "New development will be encouraged to locate outside of special flood hazard areas." Performance standards are achievement thresholds ("Minimum" and "Excellence") that identify specific ordinances, programs, or requirements that may be implemented by local governments for consistency with the regional plan.

Items identified as minimum standards are *essential* activities that local governments are expected to attain within three years of adoption of the regional plan or risk losing Qualified Local Government (QLG) status. The excellence standard, by contrast, is intended to apply to *desirable* activities that are included in a menu of recommended best practices. Any local government that attains the excellence threshold may be eligible for the DCA Signature Community Program. Examples of performance standards that address identified hazards include:

Minimum:

- Our community has an approved hazard mitigation plan
- Our Future Development Map includes a "Floodplain," "Special Flood Hazard Area" or similar category that delineates the 100-year floodplain
- Our community directs development of public infrastructure (e.g. water and sewer facilities, roads, etc.) to encourage growth in appropriate areas and discourage it in inappropriate areas (including floodplains)

Excellence:

- Our community participates in FEMA's Community Rating System (CRS) program to reduce flood losses, to facilitate accurate insurance ratings and to promote the awareness of flood insurance
- Our community has standards such as a conservation subdivision ordinance or provides incentives for new developments to include open/green space for the protection of park land, greenways, and environmentally sensitive areas
- Our community has an environmental resource inventory that maps environmentally sensitive areas (e.g. floodplains, wetlands, significant stands of old growth trees, etc.) in order to make informed decisions about areas best suited to set aside as open space

It is recommended that the TRRC regional plan incorporate the performance standards listed above into the Regional Agenda.

TRRC and/or DCA can assist the County and its municipalities with hazard identification.

Land Use Mapping

The future land use map or future development map should be used to guide development away from high hazard areas. Specifically, showing the floodplain on these maps clearly indicates areas not suitable for certain types of development. In addition, parcel-level data and details such as major streets make it easier to identify where the floodplain overlaps with properties. While character-area based future development maps generally focus on development patterns rather than parcel-specific uses, the addition of parcels along with a “Floodplain” or “Special Flood Hazard Area” character area makes the map a more effective hazard mitigation tool (see Figure 6).

It is recommended that future development maps and future land use maps show parcel lines, the floodplain boundary, and major streets (with street labels). At the regional planning level, consideration should be given to mapping floodplains separately in the Regional Agenda’s Regional Development Map so that boundaries are clearly shown.

TRRC and DCA can assist the County and its municipalities with land use mapping.

Critical Facilities Definition & List; Infrastructure & Utilities Definition & List

In the context of hazard mitigation planning, critical facilities¹ are structures the community identifies as essential to the health and welfare of the population, and that are especially important following a disaster. They include, but are not limited to: hospitals and other medical facilities, fire and police stations, primary communications facilities, emergency operations centers (EOCs), schools, shelters, and other facilities required in an emergency. Infrastructure and utilities include power stations, water and wastewater treatment facilities, water lines, gas lines, electric lines, roads and bridges.

¹The term “essential facilities” is another term used in hazard mitigation planning. Essential facilities are, generally, a subset of critical facilities that include: medical facilities, police and fire stations, emergency operations centers, evacuation shelters and schools, and other structures that house first responder equipment or personnel.



Figure 6. Example of a parcel-based Future Development Map that includes a category for the floodplain (in dark green) and shows/labels roads

CODES AND DEFINITIONS				
Facility Type (Column AD)		Structural Type (Column AB)		
ID	Description	ID	Value	Description
1	Private Two-Year College	1	C1	Concrete Moment F
2	Public Two-Year College	3	C2	Concrete Shear Wall
3	Private Four-Year College	4	C3	Concrete Frame with
4	Public Four-Year College	5	MH	Manufactured Hous
5	Airport	6	O	Other Building Type
6	City Hall	7	P1	Precast Concrete Tilt
7	City Jail	8	P2	Precast Concrete Fra
8	County Correctional Institution	9	RM1	Reinforced Masonry
9	County Jail	10	RM2	Reinforced Masonry
10	Courthouse	11	S1	Steel Moment Fram
11	Federal Penitentiary	12	S2	Steel Braced Frame
12	Fire Station	13	S3	Steel Light Frame
13	High School	15	S4	Steel Frame with Ca
14	High School, Public	16	S5	Steel Frame with Un
15	Hospital, Admissions Entrance	17	URM	Unreinforced Masor
16	Hospital, Emergency Entrance	18	UNK	Unknown Building T
17	Library	19	W1	Wood, Light Frame
18	Marshals Office	20	W2	Wood, Commercial
19	Police Station			
Private School		Occupancy Class (Column AC)		
ID	Description	ID	Value	Description
21	Sheriffs Office	1	COM1	Retail Trade
22	State Prison	2	COM2	Wholesale Trade
23	Private University	4	COM3	Personal And Repair
24	Public University	5	COM4	Professional/Techni
25	Public Vocational Technical School	7	COM5	Banks
26	Wastewater Treatment Plant	8	COM6	Hospital
27	Water System	9	COM7	Medical Office and C
28	C&D	10	COM8	Entertainment & Re
29	Landfill	11	COM9	Theaters
30	MSWL	12	COM10	Parking Garages
31	SL			

Figure 7. GEMA’s Mitigation Planning Documents webpage includes a Critical Facility Data Collection Spreadsheet (www.gema.ga.gov)

Identifying and mapping the locations of critical facilities and infrastructure provides communities an instant analysis to identify facilities that may be at risk due to flooding, tornadoes and severe storms. Policies and procedures for protecting or removing critical facilities can then be prioritized. Mapping can also aid in future placement of critical facilities to avoid at-risk locations. The comprehensive plan can include appropriate policies for protecting critical facilities and infrastructure.

Local comprehensive plans address the topics of “community facilities and services” and “transportation,” and often provide an inventory of facilities, infrastructure and utilities that can also be identified as “critical facilities.” However, a common definition of “critical facilities” is needed. The term should be incorporated into the local comprehensive plans so that these facilities are recognized by everyone. It is appropriate to develop a broader definition for critical facilities which includes infrastructure and utilities. In future plan updates, which will follow the 2013 Minimum Planning Standards, this topic can be addressed in the required “Needs and Opportunities” section, or under a separate (optional) “Hazard Mitigation” section.

The regional plan can include a definition of critical facilities in the Community Facilities and Services section and can include policy recommendations to address future critical facility siting and infrastructure expansion in the Guiding Principles section.

On-line GEMA resources can be used to assist the County and its municipalities with this task (see Figure 7).

Review of Mitigation Measures

Overview

A comprehensive review of mitigation measures within the hazard mitigation plan document is required under the Disaster Mitigation Act of 2000 (DMA) to identify the appropriate mitigation actions for implementation. This review allows a community to identify whether all reasonable measures have been evaluated, and also to determine the most appropriate ones to select for implementation.

MITIGATION MEASURE CATEGORIES

1. Prevention
2. Property Protection
3. Natural Resource Protection
4. Emergency Services
5. Structural Projects
6. Public Education and Awareness

Factors such as cost of a project, potential funding sources, community capability, and outside support are some of the variables that are typically incorporated into the decision-making process. FEMA’s STAPLEE approach (**S**ocial, **T**echnical, **A**dministrative, **P**olitical, **L**egal, **E**conomic and **E**nvironmental) should also be included in the process of evaluating alternative mitigation actions. A STAPLEE worksheet is available in FEMA’s Mitigation Planning “How-to” Guides (see the list of resources on page 17 of this report).

A mitigation project can fall under one of the six categories shown on the previous page. Local codes, regulations and standards are examples of prevention measures. Since local planning and/or zoning staff administer building and development regulations, it is important to have a coordinated review of existing regulations and potential changes or additions to support hazard mitigation goals. Needed changes or additions can be included in the Community Work Program (CWP) of the comprehensive plan.

Implementation of mitigation measures can be facilitated by the TRRC. Specific actions include the addition of key mitigation measures in the regional plan’s Implementation Program, as well as the provision of technical assistance to help the County and its municipalities implement the recommended activities.

Community Rating System Program

FEMA’s National Flood Insurance Program’s (NFIP) Community Rating System (CRS) Program was created as a comprehensive mitigation approach to encourage communities to implement floodplain management activities that go above and beyond the minimum requirements of the NFIP. The NFIP has been effective in requiring new buildings to be protected from damage by a 1% chance flood, also known as the “100-year” or “base” flood. However, flood damage still results from floods that exceed the base flood, from flooding in unmapped areas, and from flooding that affects buildings constructed before the community joined the NFIP.

Under the CRS, communities can be rewarded for doing more than simply regulating construction of new buildings to the minimal national standards. The CRS Program results in a community’s residents’ flood insurance

The screenshot shows the 'Step 1: Your Community's Floodplain' section of the CRS Community Self Assessment tool. The interface includes a navigation bar with 'Home', 'Community Self Assessment', '600-Series', 'CRS2012', and 'Contact Us'. Below the title, there is an introductory paragraph and a tip: 'If you have your hazard mitigation plan handy (and it's thorough), this step will likely go quickly'. The main section is titled 'YOUR COMMUNITY'S FLOOD EXPOSURE' and contains four data entry fields, each with a label and a note '(numbers only, no % sign)':

- Structures in your SFHA (Zones A and V)**: Total number of structures in your A and V zones: [input field]
- Percentage of these that are 1-4 family residential structures:** [input field]
- Percentage of these structures that are multifamily (5 or more families):** [input field]
- Percentage of these that are commercial or non-residential:** [input field]

Figure 8. The CRS Community Self Assessment is a tool that can help communities develop programs and identify CRS activities most appropriate for their particular flood risks

www.crs2012.org/self-assessment/the-community-self-assessment/

premiums being discounted to reflect that community's work to reduce flood damage to existing buildings, manage development in areas not mapped by the NFIP, protect new buildings beyond the minimum NFIP protection level, preserve and/or protect natural functions of floodplains, help insurance agents obtain flood data and help people obtain flood insurance.

There are 19 creditable floodplain management activities, organized under four categories: Public Information, Mapping and Regulations, Flood Damage Reduction, and Warning and Response. A community's CRS application must result in 500 credit points under the 19 activities to be eligible for a 5% discount on flood insurance premiums. Every additional 500 points results in an additional 5% reduction.

Carroll County and its municipalities do not participate in the CRS Program and are encouraged to do so.

FEMA Region IV and the Georgia Department of Natural Resources (DNR) Floodplain Management Office can assist with the CRS application process.

Hazard Mitigation Planning Resources:

2013 Community Rating System (CRS) Coordinator's Manual website <http://www.crs2012.org>

Community and Regional Resilience Institute, "Resilient Communities, Resilient Regions, A Resilient Nation" <http://www.resilientus.org/publications/presentations/index.html>

Federal Emergency Management Agency, Hazard Mitigation Planning Resources, Mitigation Planning "How-To" Guides <http://www.fema.gov/hazard-mitigation-planning-resources#1>

Federal Emergency Management Agency, Hazard Mitigation Planning Resources, Sustainability in Mitigation Planning <http://www.fema.gov/hazard-mitigation-planning-resources#1>

Georgia Department of Community Affairs, Community Development Division: *Best Practices and Georgia Examples* <http://www.dca.state.ga.us/development/PlanningQualityGrowth/programs/BestPractices.asp>

Georgia Department of Community Affairs, Community Development Division: Community Planning Institute (CPI) <http://www.dca.ga.gov/development/PlanningQualityGrowth/programs/opqg.asp>

Georgia Department of Community Affairs, Community Development Division: Construction Codes <http://www.dca.state.ga.us/development/ConstructionCodes/index.asp>

Georgia Emergency Management Agency/Homeland Security: Hazard Mitigation <http://www.gema.ga.gov/gemaohsv10.nsf/4f697eb5f4cbd51d85257729004931f8/d8f78c52e7d3d06885257270056ca2b?OpenDocument>

Natural Hazard Mitigation Association in cooperation with StormSmart <http://www.freeboard.stormsmart.org>

FEDERAL FUNDING SOURCES: HAZARD MITIGATION PLANNING

Pre-Disaster Mitigation (PDM) Program

www.fema.gov/government/grant/pdm/index.shtm

Mitigation 404 – Hazard Mitigation Grant Program (HMGP)

www.fema.gov/government/grant/hmgp/index.shtm

Flood Mitigation Assistance (FMA) Program

www.fema.gov/government/grant/fma/index.shtm