

Principles for Integrating Planning for Hazard Mitigation and Land Use

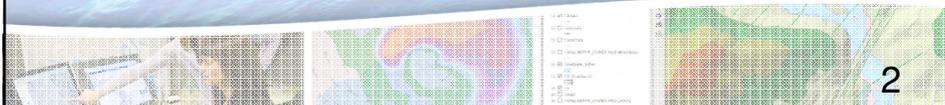


2013 Community Planning Institute

Agenda



- Project Overview
- Basics of Hazard Mitigation Planning and Comprehensive Planning
- Comprehensive Plans and Hazard Mitigation Plans: Comparative Analysis
- Comprehensive Plans and Hazard Mitigation Plans: Best Practices for Coordination
- Best Practices for Planning to Achieve Disaster Resilient Communities



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PROJECT OVERVIEW

Project Background

- **U.S. Department of Housing and Urban Development (HUD)**
 - Georgia Department of Community Affairs
 - 2008: Awarded CDBG Disaster Recovery Assistance grant funds
 - 2011: Awarded supplemental grant through the Disaster Recovery Enhancement Fund (DREF)
 - **Forward Thinking Land Use Planning**
 - Disaster Resilient Building Codes

Project Background



- **Forward Thinking**
Hazard Mitigation Planning and
Land Use Planning

- Increase awareness of hazard mitigation
- Enhance consistency among various required planning documents

Consistency/Coordination/Integration



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Project Background



- **Why?**

**Consistency
Coordination
Integration**

- Local plans need to work together
 - Comprehensive land use planning (local and regional)
 - Hazard mitigation planning

A hazard is a disaster waiting to happen!



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Project Background



Opportunities and Benefits of Integrating Hazard Mitigation into Local Planning

- **Opportunity**
 - Comprehensive Plan Update



Avoids conflicting outcomes from uncoordinated planning!

- **Benefits**
 - Promotes consistency between plans
 - Increases the visibility of mitigation goals, objectives and policies
 - Guides future development and land use
 - Improves coordination between planners and emergency managers

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Project Background



- **YOU** (Community planners and local decision makers)

...help manage risk by how **YOU** choose to:

- Plan,
- Design, &
- Build

Disaster Resilient Communities

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Project Background



- **Disaster Resilient Communities**

- Prepare for
 - Respond to
 - Recover from
- } disasters

Restoring a community more quickly to a pre-disaster condition

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>

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Project Background



House along Peachtree Creek in Atlanta

- **Question:**

- Why would someone build a house with the first floor so high?

- **Answer:**

- They didn't. In 1977, they raised the house 10 feet because Peachtree Creek flooded the first floor in 1975 & 1976

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Project Background



Atlanta neighborhood becoming disaster resilient



"My neighbors must think I am crazy!"

High water mark

100-year base flood elevation

Project Background



Maybe he is not so crazy after all.....

Project Background



Six families in this neighborhood elevated their homes

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Project Background



• Lessons Learned?

- Regulating **where** and/or **how** certain types of **development** should occur is **good planning** and a **hazard mitigation tool**

- **If you don't plan now, you'll pay later**

*Average cost of elevating residential building (1 foot)
= \$100/sq. ft. (slab on grade) and \$75/sq. ft. (non-slab on grade)*

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Project Background



• Partnerships

- Georgia Department of Community Affairs
- Georgia Emergency Management Agency
- AMEC Environment & Infrastructure, Inc.
- Representatives from construction industry and trades associations in GA
- U.S. Department of Housing and Urban Development
- Federal Emergency Management Agency
 - FEMA Region IV- Hazard Mitigation Division
 - FEMA Emergency Management Institute
- Polis Center (Indiana University – Purdue University Indianapolis)
- Information Technology Outreach Services- UGA
- Georgia Department of Natural Resources Floodplain Mapping Program

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Project Background



• Project Goals

1. New Disaster Resilient Building Codes
2. Community Plan Analysis Reports
3. New DCA Community Planning Institute Workshop: Hazard Mitigation & Land Use
4. Hazard Mitigation Planning Best Practices Guidebook for Georgia Communities
5. New or revised modules to DCA's Model Code
6. GIS: FEMA HAZUS – MH training and multi-hazard risk assessments

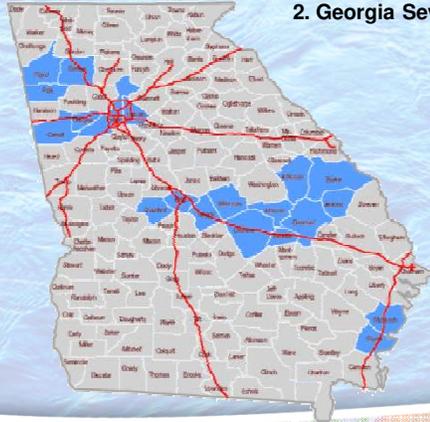
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Communities Impacted



- **Disaster Declaration from 2008:**

1. Georgia Severe Storms and Tornadoes – March 14-15, 2008
2. Georgia Severe Storms and Flooding – May 11, 2008



20 Counties:

- | | |
|-----------------|-----------------------|
| Bartow | Glynn |
| Bibb | Laurens |
| Burke | Jefferson (2x) |
| Carroll | Jenkins |
| Crawford | Johnson |
| DeKalb | McIntosh |
| Douglas | Polk |
| Emanuel | Treutlen |
| Floyd | Twiggs |
| Fulton | Wilkinson |

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Communities Impacted



- **Georgia Severe Storms and Tornadoes (DR – 1750)**

- 11 tornadoes (EFO-EF3)
- 3 fatalities
- More than 950 homes and businesses heavily damaged or destroyed
- More than \$1.3 million in federal assistance to help survivors recover
- More than \$1.8 million in federal assistance to help local governments recover
- More than \$1.7 million in SBA financial assistance

March 14-15, 2008



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Communities Impacted



- **Georgia Severe Storms and Flooding (DR – 1761)**

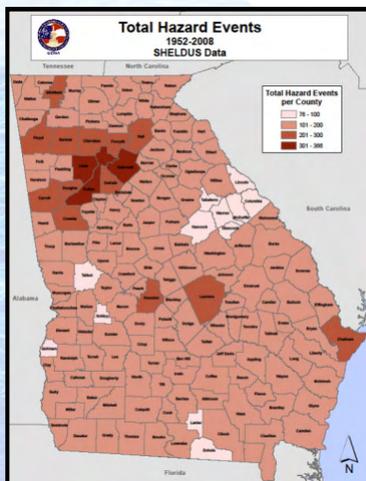
- 20 tornadoes (EFO-EF4)
- 2 fatalities
- More than 500 homes and businesses heavily damaged or destroyed
- More than \$2.4 million in federal assistance to help survivors recover
- More than \$9.4 million in federal assistance to help local governments recover
- More than \$2.5 million in SBA financial assistance

May 11, 2008



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Communities Impacted



- **Total Hazard Events by County:**

- Most of the 2008 Disaster Declaration Counties experienced between 100 and 366 hazard events between 1952 & 2008

Source: 2011 Georgia Hazard Mitigation Strategy (GEMA)

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Communities Impacted



- **Flood Hazard**

- **Definition:**

A general and temporary condition of partial or complete inundation of 2 or more acres or of 2 or more properties



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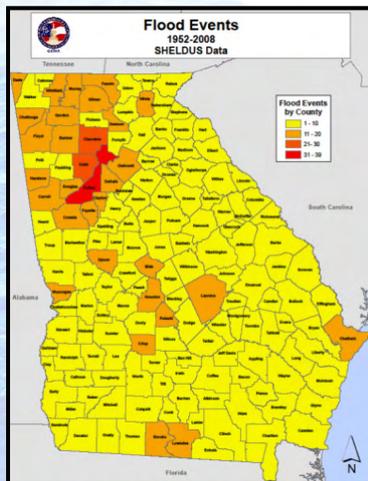
Communities Impacted



- **Flood Events by County:**

- Each 2008 Disaster Declaration County experienced flood events between 1952 & 2008 (majority had 20 or fewer, but some more than 20)

Source: 2011 Georgia Hazard Mitigation Strategy (GEMA)



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Communities Impacted

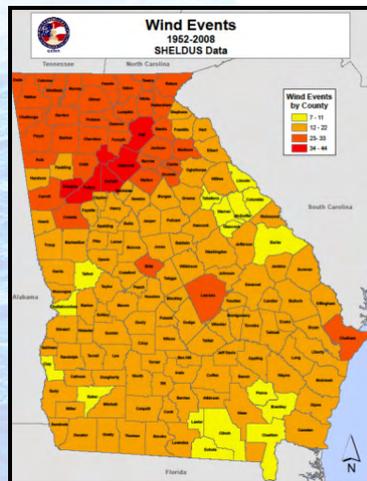
- **Severe Storm Hazard**

- **Definition:**

Combination of straight line winds and thunderstorms (lightning and hail) sometimes accompanied by tornadoes



Communities Impacted

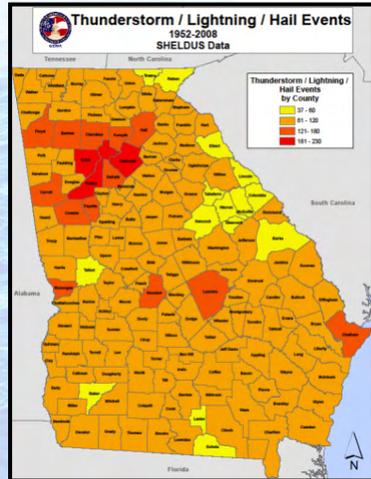


- **Wind Events by County:**

- Each 2008 Disaster Declaration County experienced between 7 & 44 wind events between 1952 & 2008

Source: 2011 Georgia Hazard Mitigation Strategy (GEMA)

Communities Impacted



- **Thunderstorm (Lightning & Hail) Events by County:**
 - Each 2008 Disaster Declaration County experienced multiple thunderstorm events between 1952 & 2008 (majority had 60 to 230)

Source: 2011 Georgia Hazard Mitigation Strategy (GEMA)

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Communities Impacted



- **Tornado**

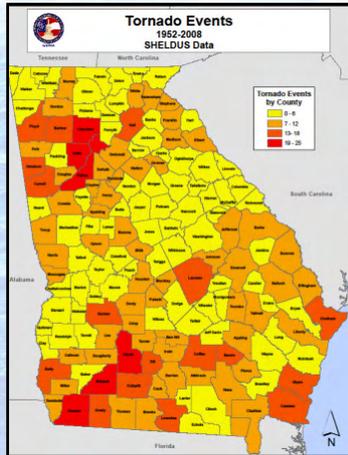
- **Definition:**

A violently rotating column of air in contact with the earth's surface (larger tornadoes may not have a funnel shape but may look more like a large cloud)



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Communities Impacted



- **Tornado Events by County:**

- Most 2008 Disaster Declaration Counties experienced between 7 and 25 tornado events between 1952 & 2008

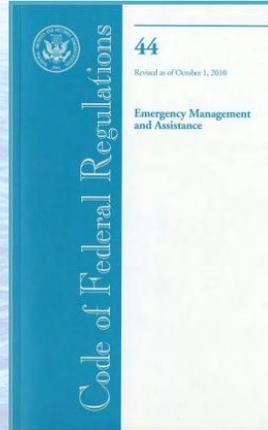
Source: 2011 Georgia Hazard Mitigation Strategy (GEMA)

BASICS OF HAZARD MITIGATION PLANNING AND COMPREHENSIVE PLANNING

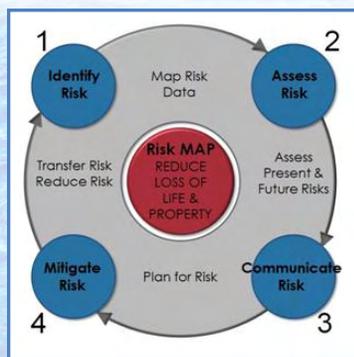
Hazard Mitigation Planning



- **Mitigation**
 - 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)



Hazard Mitigation Planning



FEMA's Risk MAP Life Cycle

- **Mitigation:**
 - Continuous process that occurs before, during, and after a disaster event

Hazard Mitigation Planning



- **Why Is Mitigation Planning Important?**

- Disasters can happen anytime and any place
- The number of natural disasters is increasing each year
- Mitigation helps reduce the cost of events

Tornado touchdown in GA



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Hazard Mitigation Planning



- **Sound Investment:**

- On average, for every \$1 spent by FEMA on Mitigation the nation gains about \$4 in future benefits (due to more efficient post-storm cleanup and rebuilding).

Source: 2005 Study by National Institute of Building Sciences (NIBS)



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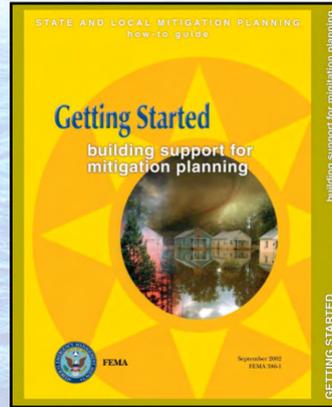
Hazard Mitigation Planning



- **Disaster Mitigation Act of 2000 (DMA 2000)**

44 CFR 201.6 Local Plans

- Public Law 106-390 provides the legal basis for FEMA's mitigation planning for state, local and tribal governments
- States, counties and their municipalities must have an approved Hazard Mitigation Plan in order to apply for and/or receive hazard mitigation grant funding



Hazard Mitigation Planning



Status:

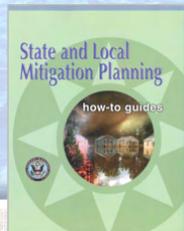
- **State plan approved for 2011 - 2014**
- **159 initial county plans approved in 2010**
 - First 5 Year Update Cycle
 - All counties have grant funding for updates
 - 108 plan updates approved
 - 51 counties in various stages of plan update

Hazard Mitigation Planning



- **DMA Planning Process (4 Phases)**

1. Organize Resources
2. Assess Risk
3. Develop Mitigation Plan
4. Implement Plan & Monitor Progress



- **Standard Process**

- Organize
- Involve the public
- Coordinate with other agencies
- Assess the hazards
- Assess the problem
- Set goals
- Review alternatives
- Draft the plan
- Implement, evaluate, revise

Comprehensive Planning



- **Purpose**

- Identify and prioritize community goals in terms of development
- Guide public policy
- Show important relationships among local issues
 - Land Use
 - Transportation
 - Economic Development
 - Housing
 - Public services/utilities

- **Benefits**

- Efficient use of tax dollars
- Smarter economic development
- Protection of private property rights
- Transparency (citizens have a voice)
- Decisions based on short and long-term considerations
- Informs decisions of any group or individual concerned with growth and development

Comprehensive Planning



- **Stakeholders**

- Public at large
- Local and regional decision-makers
- Business leaders
- Civic groups
- Non profit, faith-based & educational organizations/ institutions
- Real estate & development community



Comprehensive Planning



- **Standard Process**

- Engage community
- Identify issues
- State goals
- Analyze data
- Evaluate alternatives
- Prepare work program
- Adopt the plan
- Implement and monitor the plan



Comprehensive & Hazard Mitigation Planning



- **Differences**

- Purpose
- Function
- Communication
- Outcomes
- Mandate (1989 GA Planning Act)
- Preparation (who does it?)

- **Commonalities**

- Similar processes
- Agents of change
- Skepticism (property rights)
- Plan ahead
- Multi-objective
- Strategic/opportunistic
- Implementation

Comprehensive & Hazard Mitigation Planning



- **Challenges and Missed Opportunities**

- Hazard mitigation plans:
 - Often developed without active participation of local community development and/or planning staff
 - Often include strategies focused on structural projects vs. non-structural measures (i.e. local land use or policy alternatives)
 - Generally stand-alone documents that don't always link to other community-based plans



Comprehensive & Hazard Mitigation Planning



- **Opportunities:**
Collaboration and Integration

- Community Planners & Emergency Managers
- Comprehensive Plans & Hazard Mitigation Plans
 - Can manage known hazard risks in existing planning framework
 - Can work toward achieving development patterns that don't increase risk & can encourage redevelopment that reduces risk



Tornado in Adairsville, GA
January 30, 2013

Questions



COMPREHENSIVE PLANS & HAZARD MITIGATION PLANS: A COMPARATIVE ANALYSIS

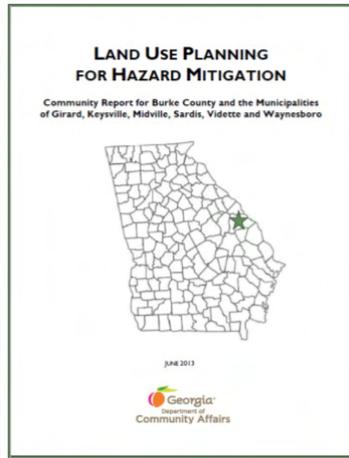
Objective

- Identify opportunities for coordination of land use planning and hazard mitigation planning
- **Compare Plans** (2008 Disaster Declaration areas = 20 counties)
 - Local Comprehensive Plans (joint & stand-alone)
 - Regional Plans
 - Adopted Hazard Mitigation Plans



Basis of Analysis

Objective



- Incorporate Findings into Community Reports
- Major Report Sections:
 - **How To:** Principals for Integrating Land Use Planning and Hazard Mitigation
 - **Key Findings**
 - **Recommendations**

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Report Section 1



- **How To: Principals for Integrating Land Use Planning and Hazard Mitigation Planning**
 - Role of Local Plans
 - **Hazard Mitigation Plan** identifies risks and level of preparedness in **near-term**
 - **Comprehensive Plan** can mitigate **longer-term** risks by promoting suitable development patterns



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Report Section 1

• How To: Principals for Integrating Land Use Planning and Hazard Mitigation Planning

- Role of Local Plans
- Public Participation in the Planning Process
 - Community discussions about natural hazards
 - “Everyone” is at the table – local staff & elected officials

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



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Report Section 1

• How To: Principals for Integrating Land Use Planning and Hazard Mitigation

- Role of Local Plans
- Public Participation in the Process
- Planning Cycles & Plan Updates
 - Do mandated planning deadlines align?

PLAN RECERTIFICATION DEADLINES:
BURKE COUNTY, GIRARD, KEYSVILLE,
MIDWILLE, SARDIS, VIDETTE &
WAYNESBORO

County Hazard Mitigation Plan:

May 2014

Short-Term Work Program/
Community Work Program:

October 2013

Local Comprehensive Plan:

October 2018



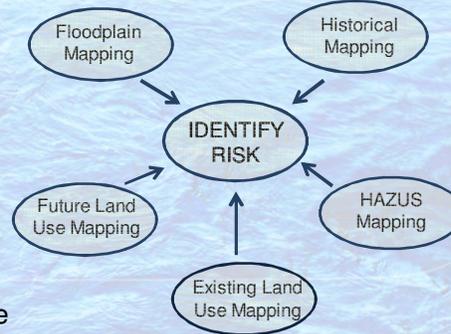
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Report Section 1



- **How To: Principals for Integrating Land Use Planning and Hazard Mitigation**

- Role of Local Plans
- Public Participation in the Process
- Planning Cycles & Plan Updates
- Mapping Makes a Difference



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Report Section 1



- **How To: Principals for Integrating Land Use Planning and Hazard Mitigation**

- Role of Local Plans
- Public Participation in the Process
- Planning Cycles & Plan Updates
- Mapping Makes a Difference
- Integration: Tools & Techniques



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Report Section 2



• Key Findings

- Summary table represents “Connects” and “Disconnects” **Where?**
 - **Here:** (review criteria per FEMA hazard mitigation planning requirements):
 - Hazard Mapping
 - Natural Hazard Discussion
 - Land Use, Critical Facilities, Infrastructure & Utilities
 - Planning Process
 - Vulnerability & Mitigation Review
- 44 items reviewed in each plan**

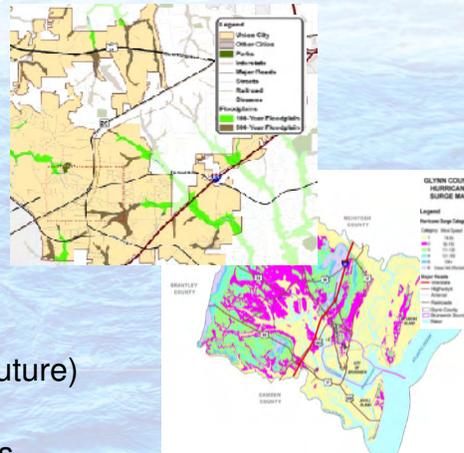
Level of Detail					Comments	Approved for Mitigation
Type	Record Mitigation Plan	Joint County/State Comprehensive Plan	Regional Plan	Local Plan		
Hazard Mapping	Medium	Low	Low	Low	Some flood hazard mapping is in hazard mitigation plan, parcel data not included in comprehensive plan map. The FIRM is not included in any plan. No other hazard mapping is included that supports current status and trends. The USA IC Regionally Important Resource Map does not address floodhazards.	✓ See pg. 12-13
Hazard Identification	Medium	Low	Low	Low	Hazard mitigation plan has a more robust discussion of flood hazards, discussed in more general terms in the local comprehensive and regional plans.	✓ See pg. 12-13
Land Use Mapping	Medium	Medium	Low	Low	Existing and future land use maps are included in the mitigation and local comprehensive plans. Future land use map (FLUM) in hazard mitigation plan is more local comprehensive plan. FLUM maps for county/cities are not generalized but contain a “Priority” category, which includes the floodplain. Road network is shown, and major roads are labeled. Regional plan provides a generalized “projected development pattern” map at the county level.	
Land Use Discussion	Medium	High	Medium	Medium	Existing and future land use/development more fully discussed in the local comprehensive plan than the other plans.	
Critical Facilities Definition & List	Medium	Low	Low	Low	No plan provides a definition of critical facilities. The hazard mitigation plan provides a complete list of such facilities whereas the local comprehensive plan and regional plan discuss some facilities (“community facilities”) which can be classified as critical facilities.	✓ See pg. 14-15
Infrastructure & Utilities Discussion Definition & List	Low	Low	Low	Low	The local comprehensive plan and regional plan address the availability of primary utilities (water and sewer treatment) and provide information about the existing transportation network, they do not describe or define infrastructure/utilities which could be impacted by natural hazards. The hazard mitigation plan does not address infrastructure and utilities outside of the critical facilities discussion.	✓ See pg. 14-15
Planning Process Discussion (structure, no. of meetings, # of staff)	High	High	Medium	Medium	Planning process was outlined in all three plans with a more detailed discussion in the hazard mitigation and local comprehensive plan. All three suggested a variety of media we used to educate and involve the public.	

Report Section 2



• Review Criteria: *Hazard Mapping*

- 100-year Flood
- Repetitive Loss
- Tornado Touchdowns
- Dam Inundation
- Other Hazards
- Land Use (existing & future)
- Critical Facilities, Infrastructure & Utilities



Report Section 2



- **Review Criteria:**

- **All Maps**

- **High Detail**

- (Parcel-based, Comprehensive Road Network, Official FIRM, Floodplain category)

- **Medium Detail**

- (Comprehensive Road Network, Official FIRM, Floodplain category)

- **Low Detail**

- (Not Parcel-based, No Comprehensive Road Network, Not Official FIRM, No Floodplain category)



Report Section 2



- **Review Criteria:**
- **Natural Hazards Discussion**

- Flood
 - Severe Storm
 - Tornado
 - Repetitive Loss

- **Review Criteria:**
- **LDCIU Discussion**

- Land Use, Development, Critical Facilities, Infrastructure & Utilities (LDCIU)

- Land Use (existing and future)
 - Redevelopment
 - Density & Population
 - Land Use Policies
 - Critical Facilities, Infrastructure, Utilities (Definition, List, Policies & Procedures)

Report Section 2

- **Review Criteria:**
Planning Process Discussion

- Public involvement summary
- Participants identified
- Timeframe
- Meetings (number/type)
- Notification tools

- **Review Criteria:**
Vulnerability & Mitigation Review

- Economy & Tax Base
- Vulnerable Populations
- Cultural & Historic Resources
- Hazard Mitigation Measures

Report Section 2

- **Review Criteria:**
Overall

- Level of Detail
 - High
 - Medium
 - Low
- 2 or more “Low” means Opportunity for Improvement

Topic	Hazard Mitigation Plan	Joint County/Local Comprehensive Plan	Regional Plan	Comments	Opportunity for Improvement
Hazard Mapping	Medium	Low	Low	Hazard mapping is included in hazard mitigation plans but not included in comprehensive plans. The FEMA is not included in any plan. No other hazard mapping included that incorporates severe storms and tornadoes. The FEMA is frequently updated. Resources that have not included in mapping.	Low 1/12
Hazard Identification	Medium	Low	Low	Hazard mitigation plan has a more robust discussion of hazards discussed in more general terms in the comprehensive and regional plan.	Low 1/12
Land Use Mapping	Medium	Medium	Low	Existing and future land use maps are included in the mitigation and local comprehensive plans. Future land use map (FLUM) in hazard mitigation plan is from local comprehensive plan. FLUM maps for counties are not parcel-based but contain a "residential" category, which includes the residential, land use is shown, and maps are not labeled. Regional plan provides a generalized "projected development pattern" map at the county level. Existing and future land use/development maps are included in the local comprehensive plan than the other plans.	Low 1/12
Critical Facilities Definition & List	Medium	Low	Low	No plan provides a definition of critical facilities. The hazard mitigation plan provides a complete list of such facilities whereas the local comprehensive plan and regional plan do not have facilities ("community facilities") which can be located in critical facilities.	Low 1/12
Infrastructure & Utilities Definition & List	Low	Low	Low	The local comprehensive plan and regional plan address the availability of primary utilities (water and sewer treatment) and provide information about the existing transportation network, but do not describe or define infrastructure/utilities which could be impacted by natural hazards. The hazard mitigation plan does not address infrastructure and utilities, except for the critical facilities discussion.	Low 1/12
Planning Process Discussion (duration, no. of meetings, # of people)	High	High	Medium	Planning process was outlined in all three plans with a more detailed discussion in the hazard mitigation and local comprehensive plan. All three suggested a variety of methods used to educate and involve the public.	Low 1/12

Report Section 3



• Recommendations

- Most common issues:
 - Hazard and Land Use Mapping
 - Hazard Identification
 - Critical Facilities / Infrastructure & Utilities
 - Review of Mitigation Measures
- Guidance for counties, cities and regional commissions
- Who can assist (DCA, RCs, GEMA, FEMA)
- Relationship to new 2013 Minimum Planning Standards
- Additional resources

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 service boundaries in quarters on floodplains, as well as generating depth grids that show property owners the potential depth of floodwaters on their property. Participation in FEMA's Hazard 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.

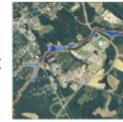


Figure 4. DCA can generate flood depth grids to illustrate the potential extent of flooding in a community.

As the regional planning level, floodplains should be identified on the Regional Important Resources Map. This map is used to develop the "Conservation" category in the regional plan's Regional Development Map and is also incorporated into the Area Requiring Special Attention Map. Additional consideration should be given to mapping floodplains separately in the Regional Development Map so that floodplain boundaries within Conservation areas are clearly shown.

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

COMPREHENSIVE PLANS & HAZARD MITIGATION PLANS: BEST PRACTICES FOR COORDINATION



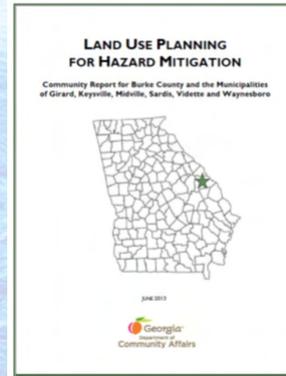
Best Practices – Coordinated Planning



- **Community Report Findings**

- Most common issues:

- Mapping (hazards & land use)
- Hazard Identification
- Critical Facilities / Infrastructure & Utilities
- Review of Mitigation Measures



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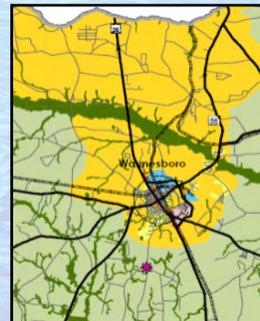
Best Practices – Coordinated Planning



Mapping

- **Goals**

- Hazard maps should inform development policy (future land use map)
- Future land use maps should identify areas not suitable for certain types of development based on known hazards



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Best Practices – Coordinated Planning



Mapping

• Issues

- Hazard Mapping
Level of Detail
- Future Land Use Mapping
Level of Detail

Help? → **DCA, RC**

• Opportunities

- Parcels, Roads, DFIRM, Depth Grids, Hazus
- Parcels, Roads, Floodplain Designation



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Best Practices – Coordinated Planning



Mapping

• Planning Requirement?

- Hazard and land use maps in HMPs? **RECOMMENDED**
- Hazard maps in comp plan update? **NO**
- Land use (future) map in comp plan update? **YES**

• Planning Recommendation (comprehensive plan update)

- Add “floodplain” category to future land use/development map
- Include or incorporate HMP by reference

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Best Practices – Coordinated Planning



Hazard Identification

- **Goals**

- Discuss the impact of natural hazards on health, safety and welfare
- Develop recommendations and policies that will result in more disaster resilient communities



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Best Practices – Coordinated Planning



Hazard Identification

- **Issue**

- Level of Detail

- **Opportunity**

- Public meetings (*comp plan and/or comp plan/HMP process*)
- HMP information



Help? → DCA, RC

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Best Practices – Coordinated Planning



Hazard Identification

- **Planning Requirement?**
 - Addressed in hazard mitigation plans? **YES**
 - Addressed in comp plan updates? **NO**
- **Planning Recommendation**
(comprehensive plan update)
 - Add HMP goals to Community Goals section
 - Discuss Natural Hazards in Needs and Opportunities section
 - Add HMP actions to work program (CWP)
 - Include or incorporate HMP by reference
 - Hazard Mitigation element (optional)

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Best Practices – Coordinated Planning



Critical Facilities, Infrastructure & Utilities

- **Goal**
 - Protect facilities, infrastructure and utilities that are:
 - Essential to the health and welfare of the population
 - Especially important following a disaster



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Best Practices – Coordinated Planning



Critical Facilities, Infrastructure & Utilities

- Issue

- Inconsistent definition (“community facilities” vs. “critical facilities”)

- Opportunity

- Common definition (“community facilities” to “critical facilities”)

CODES AND DEFINITIONS			
Facility Type (Column AD)		Structural Type (Column AB)	
ID	Description	ID	Value
1	Private Two-Year College	1	C1
2	Public Two-Year College	3	C2
3	Private Four-Year College	4	C3
4	Public Four-Year College	5	MH
5	Airport	6	O
6	City Hall	7	P1
7	City Jail	8	P2
8	County Correctional Institution	9	RM1
9	County Jail	10	RM2
10	Courthouse	11	S1
11	Federal Penitentiary	12	S2
12	Fire Station	13	S3
13	High School	15	S4
14	High School, Public	16	S5
15	Hospital, Admissions Entrance	17	URM
16	Hospital, Emergency Entrance	18	URK
17	Library	19	W1
18	Marshals Office	20	W2
19	Police Station		
20	Private School		
21	Sheriff's Office		
22	State Prison		
23	Private University	1	COM1
24	Public University	2	COM2
25	Public Vocational Technical School	4	COM3
26	Wastewater Treatment Plant	5	COM4
27	Water System	7	COM5
28	C&D	8	COM6
29	Landfill	9	COM7
30	MSWFL	10	COM8
31	SL	11	COM9
		12	COM10

Help? → GEMA

Best Practices – Coordinated Planning



Critical Facilities, Infrastructure & Utilities

- Planning Requirement?

- Addressed in hazard mitigation plans? **YES**
- Addressed in comp plan updates? **NO**

- Planning Recommendation

- (comprehensive plan update)
- Add HMP goals to Community Goals section
 - Discuss Critical Facilities in Needs and Opportunities section
 - Add HMP actions to work program (CWP)
 - Include or incorporate HMP by reference
 - Hazard Mitigation element (optional)

Best Practices – Coordinated Planning



Review of Mitigation Measures

- **Goal**

- Review existing plans and regulations (and potential changes or additions) to support hazard mitigation goals

MITIGATION MEASURE CATEGORIES

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

69

Best Practices – Coordinated Planning



Review of Mitigation Measures

- **Issue**

- Level of Detail

- **Opportunity**

- HMP recommendations
- Evaluate local codes, policies, plans



Help? → **RC, FEMA, DNR**

70

Best Practices – Coordinated Planning



Review of Mitigation Measures

- **Planning Requirement?**
 - Addressed in hazard mitigation plans? **YES**
 - Addressed in comp plan updates? **NO**
- **Planning Recommendation** (*comprehensive plan update*)
 - Amend work program (CWP) to include needed changes, including HMP recommendations
 - Include or incorporate HMP by reference
 - Hazard Mitigation element (optional)

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Best Practices – Coordinated Planning



- **Planning Process**
 - Involve/coordinate variety of staff and data
 - Planning & Development / Comp Plan
 - Emergency Management / HMP
 - Discuss natural hazards in public meetings/activities
 - **Align HMP and comp plan deadlines** (*work with DCA*)



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BEST PRACTICES FOR PLANNING TO ACHIEVE DISASTER RESILIENT COMMUNITIES

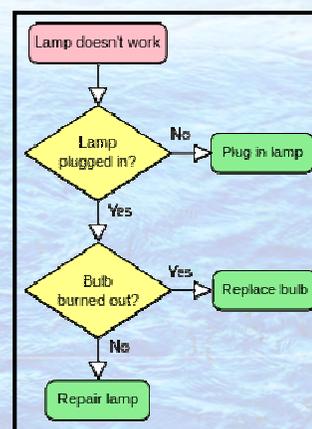
73

Mitigation Review

- **Select What Works Best for Your Community**

- Review measures in the six mitigation categories

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



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Mitigation Category #1



- **Preventative Measures**

- Activities that keep a problem from getting worse

Examples

- Mapping and data
- Open space Preservation
- Planning and zoning
- Development regulations
- Building codes
- Maintenance (drainage)
- Coastal setbacks

75

Mitigation Category #2



- **Property Protection Measures**

- Activities usually undertaken by a homeowner on a building-by-building or parcel basis

Examples

- Acquisition
- Relocation
- Building elevation
- Retrofitting
- Insurance



Relocation of historic home

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Mitigation Category #3



• Natural Resource Protection

- Activities that preserve or restore natural areas or natural functions of floodplains and watershed areas

Examples

- Wetlands protection
- Erosion & sediment control
- Natural area preservation & restoration
- Water quality improvement

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Mitigation Category #4



• Emergency Services Activities

- Measures taken during an emergency to lessen its impact

Examples

- Critical facilities protection
- Hazard threat recognition, warning & response
- Post-disaster mitigation policies



Lightning rod on Emergency Operations Center

78

Mitigation Category #5



- **Structural Project Activities**

- Activities that keep the hazard away from an area

Examples

- Reservoirs
- Levees & floodwalls
- Diversions
- Fire breaks
- Channel modifications
- Storm drain improvements

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Mitigation Category #6

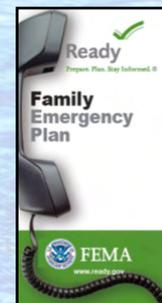


- **Public Information Activities**

- Efforts to advise property owners, potential property owners and visitors about hazards and ways to protect themselves

Examples

- Map information
- Outreach projects
- Real estate disclosures
- Library & social media
- Technical assistance
- Environmental education



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Mitigation Options

- **Consider Options**

- Adapting to the hazard
- Altering the hazard
- Averting the hazard
- Avoiding the hazard



Mitigation Options

- **Complete a Comprehensive Review**

- Consider all options (discuss why some measures work and why others don't)

- Will it work?
- Is it cost-beneficial?
- Is it affordable?
- Is it legal?
- Is it fair?
- Do people want it?
- Is funding available?
- Are there administrative burdens?
- Is it politically acceptable to community leaders?
- Is it environmentally sound?

Best Practices Research



- Sources and Additional Information



- APA – PAS Reports
- FEMA – Mitigation Reports and Success Stories
- NFIP – Community Rating System
- State Governments Innovative Approaches
- Local Governments' Implementation

Best Practices Research



- Sources and Additional Information



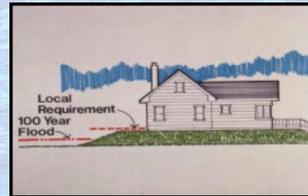
Best Practices - Flood



Establish Basic Standards:

- Freeboard

- The National Flood Insurance Program (NFIP) requires that the lowest floor of residential structures be elevated to or above the base flood elevation (BFE).



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Best Practices - Flood



Establish Basic Standards:

- Freeboard

- Non-residential structures: elevated or floodproofed to or above the BFE
- Attached garages and utilities: elevated or use flood-resistant materials



88

Best Practices - Flood



Consider Higher Standards:

- **Protect existing and future development that exceed the minimum criteria of the National Flood Insurance Program (NFIP).**
- **The minimum NFIP standards provide a great deal of flood protection, but damage can still result:**
 - Estimates of flood heights are subject to various errors and are sometimes low
 - The next flood can always be higher (exceeding the 100-year event)
 - Urbanization and changes in the watershed
 - Filling and other development in floodplain can reduced storage and conveyance capacity

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Best Practices - Flood



Consider Higher Standards:

- **Prohibition of Fill**
 - Reduces floodplain storage capacity and has a negative impact on drainage
 - No CLOMR-F or LOMAR-F



90

Best Practices - Flood



Consider Higher Standards:

- **Compensatory Storage**

- Remove an equal amount of fill from floodplain to maintain floodplain storage and conveyance capacity



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Best Practices - Flood



Consider Higher Standards:

- **Other:**

- Prohibition of Buildings
- Cumulative Substantial Improvement
- Protection of Critical Facilities (500-year or 1' above)
- Local Drainage Protection (No Adverse Impacts – NAI)
- Enclosure Limits
- Coastal A-Zones



Clarkdale Elementary School
Austell, GA

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Best Practices - Flood



Available Standards for Adoption – State Models

- **Floodplain Regulations Found in Local Flood Damage Prevention Ordinance**
 - State DNR model ordinance
 - Revised June 2012 per FEMA recommendations
 - NFIP participants required to update local ordinance within 6 months of:
 - Receiving notification of changes to Federal or State laws or regulations that necessitate amending the ordinance
 - Receiving new flood data/maps by FEMA

93

Best Practices - Flood



Available Standards for Adoption – State Models

- **Floodplain Regulations Found in Local Flood Damage Prevention Ordinance**
 - DCA model ordinance (2007)
 - Higher standards (compared to 2012 DNR model)
 - Lowest floor of residential structures elevated 3' above BFE
 - Cumulative substantial improvement standard

The Model Code	
The Model Code is offered in both .pdf and .doc formats for your convenience.	
COVER AND CONTENTS	.pdf / .doc
PART ONE: STANDARD TEMPLATE FOR ALL ORDINANCES	.pdf / .doc
PART TWO: REGULATIONS IMPLEMENTING RULES FOR ENVIRONMENTAL PLANNING CRITERIA	.pdf / .doc
PART THREE: ENVIRONMENTAL PROTECTION	
3-1 Soil Erosion and Sedimentation	.pdf / .doc
3-3 Flood Damage Prevention	.pdf / .doc
3-4 Wetlands and Riparian Protection	.pdf / .doc
3-5 Environmental Impact	.pdf / .doc

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Best Practices - Flood



Available Standards for Adoption – Regional Models

- **Floodplain Regulations Found in Local Flood Damage Prevention Ordinance**

- Metropolitan North Georgia Water Planning District
- 15 counties, 90+ cities
- Model ordinance (2006)



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Best Practices - Flood



Available Standards for Adoption – Regional Models

- **Floodplain Regulations Found in Local Flood Damage Prevention Ordinance**

- State DNR model ordinance for coastal communities (2012)
 - Coastal High Hazard Areas, V-Zones
- Georgia Coastal Counties Mapping Project
 - Updated DFIRMs (2014)



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Best Practices - Flood



NATURAL RESOURCE PROTECTION

PROPERTY PROTECTION

Protect Floodplain Functions

Best Practices - Flood



Basic Principles

- **Protect Floodplain Functions & Natural Resources**

- River banks (bank stabilization and building setbacks)
- Wetlands
- Riparian buffers
- Dunes

Some Natural Functions of Floodplains

WATER RESOURCES

Natural Flood and Erosion Control

- Provide flood storage and conveyance
- Reduce flood velocities
- Reduce peak flows
- Reduce sedimentation

Water Quality Maintenance

- Filter nutrients and impurities from runoff
- Process organic wastes
- Moderate temperature fluctuations

Groundwater Recharge

- Promote infiltration and aquifer recharge
- Reduce frequency and duration of low surface flows

BIOLOGICAL RESOURCES

Biological Productivity

- Promote vegetative growth through rich alluvial soils
- Maintain biodiversity
- Maintain integrity of ecosystems

Fish and Wildlife Habitats

- Provide breeding and feeding grounds
- Create and enhance waterfowl habitat
- Protect habitats for rare and endangered species

– A United National Program for Floodplain Management
FEMA-248 (1994)

Best Practices - Flood



Available Standards for Adoption – State Models (DCA)

- **Natural Resource Protection Ordinances**
 - Water Supply Watersheds
 - Stream buffer/setback requirements
 - Wetlands
 - Suitable/unsuitable uses
 - Protected River Corridors
 - Buffer zones /land use requirements

The Model Code
The Model Code is offered in both .pdf and .doc formats for your convenience.

COVER AND CONTENTS .pdf / .doc

PART ONE: STANDARD TEMPLATE FOR ALL ORDINANCES .pdf / .doc

PART TWO: REGULATIONS IMPLEMENTING RULES FOR ENVIRONMENTAL PLANNING CRITERIA .pdf / .doc

PART THREE: ENVIRONMENTAL PROTECTION
 §3-1 Soil Erosion and §3-2 Grading .pdf / .doc
 §3-3 Flood Damage Prevention .pdf / .doc
 §3-4 Hillside and Ridgeline Protection .pdf / .doc
 §3-5 Environmental Impact .pdf / .doc

PART FOUR: SUBDIVISIONS AND LAND DEVELOPMENT
 §4-1 Subdivisions and Land Development .pdf / .doc
 §4-2 and 4-3 Alternative Standards .pdf / .doc
 §4-4 Tree Protection .pdf / .doc
 §4-5 Landscaping and Buffers .pdf / .doc

PART FIVE: PERFORMANCE-BASED REGULATIONS THAT DO NOT USE A MAP
 §5-1 Off-site Impacts .pdf / .doc
 §5-2 Performance Standards .pdf / .doc
 §5-3 Nuisance .pdf / .doc
 §5-4 Major Permit Requirement .pdf / .doc
 §5-5 Land Use Guidance (Point) System .pdf / .doc
 §5-6 Traffic Impact Studies .pdf / .doc

PART SIX: USE-BASED RESTRICTIONS THAT DO NOT USE A MAP .pdf / .doc

Best Practices - Flood



Available Standards for Adoption – State Models (DCA)

- **Natural Resource Protection Ordinances**
 - Mountain Protection
 - Soil Erosion (see 2009 **Model Soil Erosion, Sedimentation and Pollution Control Ordinance**, Georgia Soil and Water Conservation Commission)
 - Grading
 - Hillside and Ridgeline Protection

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 §5-5 Land Use Guidance (Point) System .pdf / .doc
 §5-6 Traffic Impact Studies .pdf / .doc

PART SIX: USE-BASED RESTRICTIONS THAT DO NOT USE A MAP .pdf / .doc

Best Practices - Flood



Available Standards for Adoption – Regional Models



- Stream Buffer Protection Ordinance



- Coastal Riparian Buffer Ordinance
- Natural Resources Protection Ordinance for Coastal Georgia



- Wetlands Ordinance for Coastal Counties

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Best Practices - Flood



PREVENTATIVE

NATURAL RESOURCE PROTECTION

STRUCTURAL PROJECTS

PROPERTY PROTECTION

EMERGENCY SERVICES

PUBLIC INFORMATION

Community Rating System (CRS) Participation

102

Best Practices - Flood



- **Participate in the Community Rating System Program (CRS)**
 - FEMA Mitigation Program (higher standards, insurance tool, premium reductions)



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Best Practices - Flood



**PROPERTY
PROTECTION**

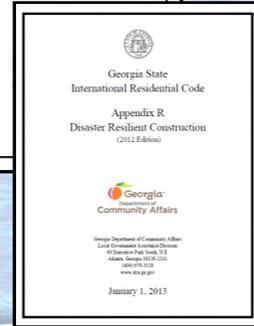
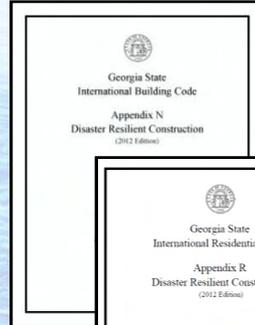
Flood Resistant Construction

104

Best Practices - Flood



- **Adopt DCA Disaster Resilient Building Codes (OPTIONAL)**
 - Appendices to IBC/IRC
 - Flood damage resistant materials
 - Location of materials
 - Fasteners and connectors used for materials



105

Best Practices - Flood



PREVENTATIVE

NATURAL RESOURCE PROTECTION

Stormwater Regulations

106

Best Practices - Flood



• Encourage Green Infrastructure (GI)

- Uses natural processes to manage stormwater
- Citywide/countywide, GI is a system of natural areas that provides flood protection, cleaner water, etc.
- For a neighborhood or site, GI stormwater management systems mimic nature by soaking up and storing water vs. releasing water
- GI elements include:
 - Rain gardens
 - Permeable pavement
 - Land conservation
 - Urban tree canopy
 - Bio swales
 - Green roofs
 - Green streets



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Best Practices - Flood



• GI Approach Options

- Local ordinances and guidelines can encourage or require GI for development projects
- Example: Atlanta-specific supplement to Coastal Stormwater Supplement (CSS), which builds upon GA "Blue Book" (Georgia Stormwater Management Manual/ GSMM) with additional GI practices



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Best Practices - Flood



PREVENTATIVE

**PROPERTY
PROTECTION**

**NATURAL RESOURCE
PROTECTION**

**PUBLIC
INFORMATION**

MAPPING

109

Best Practices - Flood



Hazard Mapping

- **Improve Future Land Use Mapping**

- Floodplains
- Parcel based
- Comprehensive road network
- Other Risk areas



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Best Practices - Flood



Hazard Mapping

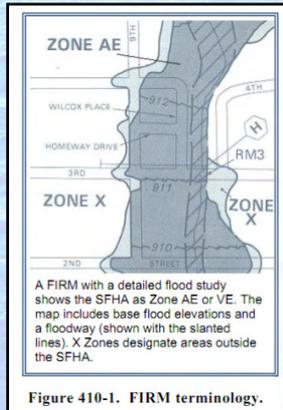


Figure 410-1. FIRM terminology.

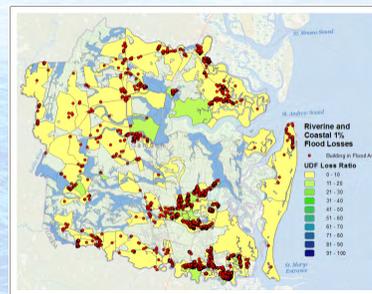
- **Recognize Official Flood Insurance Rate Map – FIRM**
 - Zone AE = High Hazard Riverine Zone
 - Zone VE = High Hazard Coastal Zone
 - Floodway and Floodway Fringe
 - Zone X = Low Hazard Zone (B or C Zone)

Best Practices - Flood



Hazard Mapping

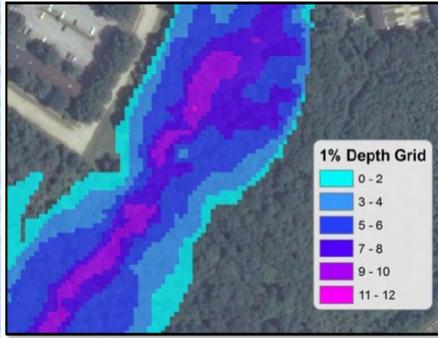
- **Use FEMA’s Hazus (Hazards US) Program**
 - Nationally standardized methodology, contains modules for estimating potential losses from earthquakes, floods and hurricanes



Best Practices - Flood



Hazard Mapping



- Hazus
 - GIS technology to estimate physical, economic, social impacts from disasters
 - Users can visualize the spatial relationship between populations and more permanently fixed geographic assets or resources

Best Practices - Flood



Hazard Mapping: Hazus Outputs

	Earthquake Ground Shaking Ground Failure	Flood Frequency Depth Discharge Velocity	Hurricane Pressure Missile Rain
Direct Damage			
General Building Stock	✓	✓	✓
Essential Facilities	✓	✓	✓
High Potential Loss Facilities	✓		
Transportation Systems	✓	✓	
Utility Systems	✓	✓	
Induced Damage			
Fire Following	✓		
Hazardous Materials Release	✓		
Debris Generation	✓	✓	✓
Direct Losses			
Cost of Repair	✓	✓	✓
Income Loss	✓	✓	✓
Crop Damage			
Casualties	✓	Generic Output	
Shelter Needs	✓	✓	✓
Indirect Losses			
Supply Shortages	✓	✓	
Sales Decline	✓	✓	
Opportunity Costs	✓	✓	
Economic Loss	✓	✓	

Best Practices - Flood



PREVENTATIVE

**PROPERTY
PROTECTION**

**NATURAL RESOURCE
PROTECTION**

Open Space Protection

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Best Practices - Flood



Land Trust for Tennessee – Nashville
Cumberland River

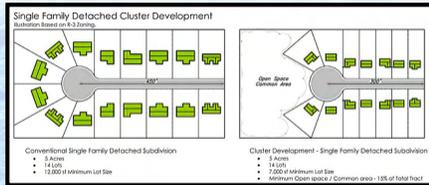
- **Encourage Open Space Protection**

(incentives, regulations, and/or acquisition)

- Prevent or minimize development in the regulatory floodplain that obstructs floodwaters or exposes buildings to damage

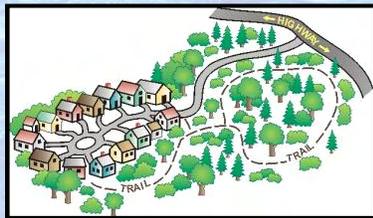
116

Best Practices - Flood



• Open Space Protection Options

- Cluster Development/ Conservation Subdivisions
- PUD's
- Conservation Easements (Transfer/Purchase of Development Rights)
- Greenways



Best Practices - Flood



Available Standards for Adoption – State Models

PART EIGHT: SPECIAL GROWTH MANAGEMENT TECHNIQUES

88-1 Rural Clustering .pdf / .doc

88-2 Cluster .pdf / .doc

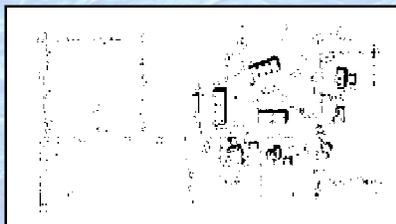
88-3 Development Agreement .pdf / .doc

88-4 Interim Development Regulations .pdf / .doc

88-5 Affordable Housing .pdf / .doc

• Rural Clustering (DCA)

- Permitted residential development density is clustered
- Remaining area (40% min.) for agriculture, forest land, open space, and environmentally sensitive areas



Best Practices - Flood



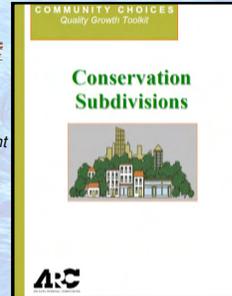
Available Standards for Adoption – Regional Models

- **Conservation Subdivision Ordinance**

- Alternative to conventional subdivision development
- Condense development and preserve open space, including sensitive natural resources
- Allow “by right” in residential zoning districts to encourage use (vs. a need to rezone)



Sources of Model Conservation Subdivision/Open Space Development Ordinances



Best Practices - Flood



STRUCTURAL PROJECT

PREVENTION

PROPERTY PROTECTION

NATURAL RESOURCE PROTECTION

Infrastructure Projects

Best Practices - Flood



- **Improve Stormwater Capacity & Drainage Maintenance**

- Undersized stormwater drainage systems and unmaintained surface systems can cause localized flooding



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Best Practices - Flood



- **Plan and Implement Effective Road and Bridge Projects**

- Build/raise above Base Flood Elevation (BFE) to maintain dry access



Douglas County : Flooding of I-20 (top) and a washed out bridge

122

Best Practices - Flood



PUBLIC INFORMATION

Public Outreach & Awareness

Best Practices - Flood



• Expand Outreach and Awareness

- Educate property owners (mitigation techniques)
- Increase awareness of flood insurance
- Flood risk and flood safety
- Social media
- HOA meetings



Your favorite TV's insurance doesn't cover floods...

Federal Flood Insurance does

Floods can happen anytime, anywhere, including Dallas. They cause enough real destruction—physical, emotional and financial—to make them victims realize the damage and demand for flood insurance.

A common myth is that flood insurance is only available to people living in flood-prone areas. The truth is, all residents in the City of Dallas are eligible for purchase low-cost flood insurance through the National Flood Insurance Program.

For most homeowners, business owners, and renters, this program is the only way to purchase flood insurance. Most homeowners policies do not cover flooding.

Remember: Flood risk happens any time, anywhere. Will you ever get it? Guaranteed.

Check your homeowners policy cover floodings? Probably not.

Flood policies usually have a 30-day waiting period before they take effect. Flood insurance is not available in some areas.

Check your policy and find out if you are covered. Flood insurance is not available in some areas.

Only Federal Flood Insurance will protect you for risks outside of your property.

Floods can happen anytime, anywhere. Will you ever get it? Guaranteed.

In 2013, Congress passed the Flood Insurance Reform Act. This bill will help to reduce the cost of flood insurance for many people. It will also help to make it easier to get flood insurance. Flood insurance is not available in some areas.

Check your policy and find out if you are covered. Flood insurance is not available in some areas.



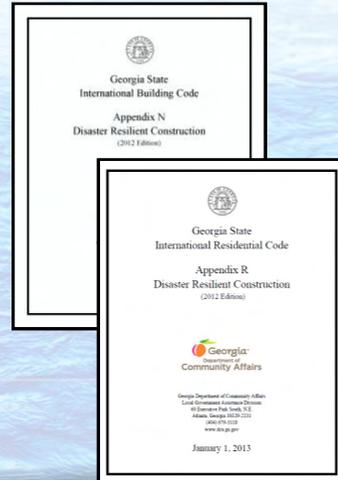


Best Practices - Severe Storms



- **Encourage High-Wind Resistant Construction**

- DCA Disaster Resilient Building Code Appendices (optional)
- IBC/IRC increased construction requirements



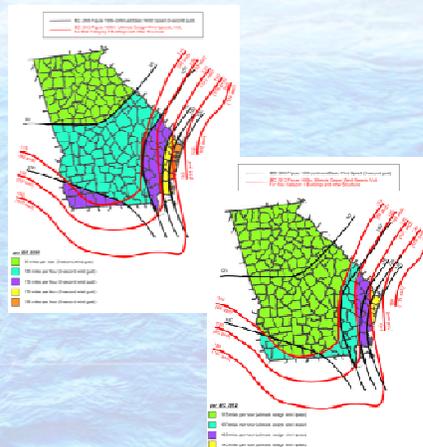
129

Best Practices - Severe Storms



- **High-Wind Resistant Construction (IBC)**

- Wind Load
 - Updated Base Wind Speed Map (2012 IBC)
 - Wind Load Options
 - Target Performance and Design Criteria



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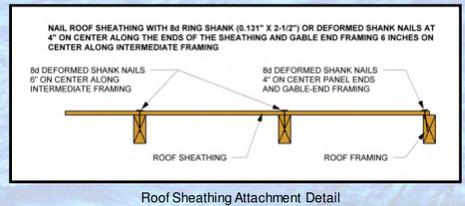
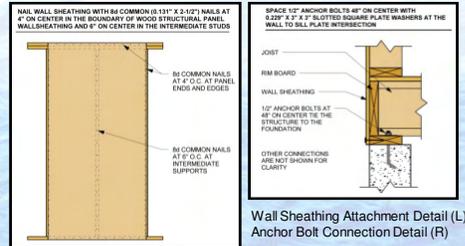
Best Practices - Severe Storms



- **High-Wind Resistive Construction (IRC)**

- One- and two-family dwellings

- Structural design
- Fasteners and cladding
- Fenestration (doors and windows)
- Roofing



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Best Practices - Severe Storms



Southern Live Oak (*Quercus virginiana*)
 LSU AG Center www.lsuagcenter.com

- **Encourage Strategic Tree Selection and Planting**

- Encourage wind resistant tree species through landscape and tree ordinances and/or public outreach materials
- Extension service

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Best Practices - Severe Storms



- **Encourage Strategic Tree Selection and Planting**

- Native trees with highest wind resistance:

- Medium to Large: American Holly, Live Oak, White Oak, Southern Magnolia
- Small: Flowering Dogwood, Crape Myrtle, Yaupon Holly



Southern Magnolia



Flowering Dogwood

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Best Practices - Severe Storms



- **Encourage Strategic Tree Selection and Planting**

- Avoid conflicts with above ground utilities:

1. Determine half the average mature crown spread of the tree
2. Add 15 feet to the measurement
3. Resulting distance is the closest to an overhead power line that the tree may be safely planted



Source: Georgia Forestry Commission
www.gfc.state.ga.us

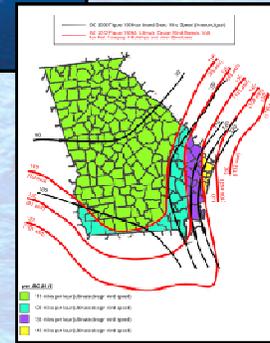
134

Best Practices - Severe Storms



- **Consider Resiliency of Signs**

- Local sign ordinance provisions
 - Shall be designed, constructed and maintained in accordance with the IBC
 - Shall be designed to withstand the minimum wind loads prescribed in the IBC / or by _____ County
 - Certification of Wind-Load Resistance required to be signed by a certified engineer; examples:
 - Carroll County – signs >10 feet*
 - Glynn County – signs >20 feet*



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Best Practices - Severe Storms



**PROPERTY
PROTECTION**

PREVENTION

**EMERGENCY
SERVICES**

MAINTENANCE PROGRAMS

136

Best Practices - Severe Storms



- **Maintain Power Lines & Infrastructure**
 - Inspection and maintenance program
 - Over head versus buried lines
 - Tree trimming program

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BEST PRACTICES – TORNADOS



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Best Practices - Tornadoes

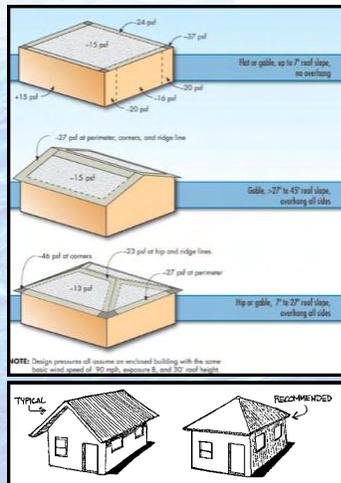


PROPERTY PROTECTION

PREVENTION

BUILDING DESIGN

Best Practices - Tornadoes



- **Improve Roof Design**
 - Promote or require standards to better withstand wind forces
 - Type (hip, gable, flat)
 - Slope
 - Overhang
 - Consider:
 - ✓ Roofs with multiple slopes (hip = 4 vs. gable = 2)
 - ✓ 30° slope
 - ✓ No greater than 20 inch overhang

Best Practices - Tornadoes



- **Adopt Optional DCA Disaster Resilient Building Code (DRBC) Appendices**

- High-wind resistive construction
- Residential storm shelters and safe room construction standards (stand-alone or internal to a building)



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Best Practices - Tornadoes



- **Locate Community Safe Rooms or Storm Shelters in Manufactured Home Parks**

- Standards (same as DRBC Appendices):
 - Safe Room: FEMA 361
 - Storm Shelter: International Code Council (ICC) 500
- Consider as development requirement
- Federal Tornado Shelters Act
 - CDBG funds can be used to construct tornado-safe shelters in manufactured home parks



Dome Tornado Shelter/Community Center in a Manufactured Home Park (MHP)

Funding: ¼ FEMA, ¼ MHP Owner

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Best Practices - Tornadoes



PUBLIC INFORMATION

Public Outreach & Awareness

Best Practices - Tornadoes



- **Expand Outreach and Awareness**

- Watch versus warning
- Sirens
- Social media
- Family plan
- Language (non-English speakers)



BECOMING DISASTER RESILIENT: NEXT STEPS

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Next Steps

- **Read Community Report**

<http://www.dca.state.ga.us/development/PlanningQualityGrowth/programs/dref.asp>

- General and specific recommendations
- Can be useful to any GA community
- Contacts are there to help

LAND USE PLANNING FOR HAZARD MITIGATION

Community Report for Burke County and the Municipalities
of Girard, Keysville, Midville, Sardis, Vidette and Waynesboro



June 2013

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Next Steps



- Be familiar with your plans and their deadlines
- Ideally, update both plans at the same time....ask DCA to modify comp plan deadline to be closer to HMP deadline

PLAN RECERTIFICATION DEADLINES:
CRAWFORD COUNTY & THE CITY OF
ROBERTA



County Hazard Mitigation Plan:

August 2017

Local Comprehensive Plan:

October 2017

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Next Steps



- **Use Comprehensive Plan's Community Work Program (CWP) to make incremental changes:**
 - “Review comprehensive plan goals, objectives and policies to identify those that relate to hazard mitigation (e.g. future development, natural resource protection, community facilities and services, and transportation)”
 - “Coordinate with the County Emergency Management Agency (EMA) on the development of the hazard mitigation plan update”
 - “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”

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Next Steps



- **Update land use and development codes:**

- DCA Model Codes

<http://www.dca.state.ga.us/development/planning/qualitygrowth/programs/modelcode.asp>

- DNR Model Codes (flood damage prevention)

<http://www.georgiadfirm.com/communityoff/commdocs.htm>

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Next Steps



- **Update land use and development codes:**

- Metropolitan North Georgia Water Planning District Model Codes

<http://www.northgeorgiawater.org/stormwater/model-ordinances>

- GA DNR Coastal Resources Division (variety of model codes for Coastal GA)

<http://coastalgadnr.org/cm/green/mo>

Kelly.Hill@gadnr.org, 912-264-7218

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Next Steps



- **Update building codes:**

- Optional DCA Disaster Resilient Building Code (DRBC) Appendices

<http://www.dca.ga.gov/development/construction/codes/programs/DRBCWorkshop.asp>

- Georgia State International Building Code Appendix N Disaster Resilient Construction
- Georgia State International Residential Code Appendix R Disaster Resilient Construction

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Next Steps



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Next Steps



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