Hazard Mitigation and Land Use Planning

Can Two Plans Become One?

David A. Stroud, CFM
Objectives

• Project Background
• Communities Impacted
• Methodology
• Analysis
• Outcomes
• Implementation
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

• Partnerships

- Georgia Department of Community Affairs
- Georgia Emergency Management Agency
- AMEC Environment & Infrastructure, Inc.
- Representatives from the construction industry and trades associations in Georgia
- 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
Project Background

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

Disaster Declaration from 2008:

2. Georgia Severe Storms and Flooding – May 11, 2008

20 Counties:

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

- DR – 1750
  - 4 Counties: Individual Assistance
  - 3 Counties: Individual and Public Assistance
  - NW GA
    - Fulton County
      - Atlanta
    - DeKalb
Communities Impacted


- 11 tornadoes (EF0-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
Communities Impacted

- **DR – 1761**
  - 4 Counties Public Assistance
  - 10 Counties Individual and Public Assistance
    - Jefferson County under both Declarations
    - Two Coastal Counties
Communities Impacted

Georgia Severe Storms and Flooding (DR-1761)  March 11, 2008

- 20 tornadoes (EF0-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
Methodology

Plans Compared

- Local Comprehensive (joint & stand-alone)
- Regional Comprehensive
- Local Hazard Mitigation (county & municipalities)
Methodology

Carroll County, Georgia
Hazard Mitigation Plan

A Multi-Jurisdictional Plan

Includes jurisdictions of Carroll County, the Cities of Carrollton, Villa Rica, Temple, Bowdon, Bremen, Mt. Zion, Whiteburg and Roopville.

- Review Criteria Categories
  - Hazard Mapping
  - Natural Hazard Discussion
  - Land Use/Critical Facilities/Infrastructure & Utilities
  - Planning Process
  - Vulnerability & Mitigation Review
  - (44 items evaluated in each plan)
Methodology

• Hazard Mapping:
  – Flood 100, < 100
  – Repetitive Loss
  – Tornado Touchdowns
  – Dam Inundation
  – Other Hazards
  – Land Use (existing & Future)
  – Critical Facilities, Infrastructure, Utilities

• Natural Hazards Discussion:
  – Flood
  – Severe Storm
  – Tornado
  – Repetitive Loss
Methodology

• **LDCIU Discussion:**
  - Land Use (existing and future)
  - Redevelopment
  - Density & Population
  - Land Use Policies
  - Critical Facilities (Definition, List, Policies & Procedures)

- Infrastructure & Utilities (Definition, List, Policies & Procedures)
- Building Code (Policies)
Methodology

• Planning Process:
  – Discussion
  – Participants Identified
  – Time Frame
  – Meetings (Number & Type)
  – Use of Media
  – Questionnaire
  – Goal Development
  – Public Involvement & Adoption

• Vulnerability & Mitigation Review:
  – Six Mitigation Categories
  – Economy & Tax Base
  – Vulnerable Populations
  – Cultural & Historic Resources
Methodology

• Review Categories:
  – Element Requirement
    • Required
    • Recommended
    • Not Required
  – Level of Detail
    • Poor - Low
    • Good - Medium
    • Best - High

• Hazard Mapping:
  – Natural Hazard
    • High (Parcel Based, Comprehensive Road Network, Official FIRM)
    • Medium (Comprehensive Road Network, Official FIRM)
    • Low (Not parcel based, No Comprehensive Road Network, Not Official FIRM)
### Georgia DCA Land Use Planning for Hazard Mitigation Comparative Analysis Checklist

**County:** Carroll  
**Cities:** Bowdon, Bremen, Carrolton, Mt. Zion, Roopville, Temple, Villa Rica, Whitesburg  
**Date Reviewed:** October 11, 2012  
**Reviewer:** Stroud, Hatley


<table>
<thead>
<tr>
<th>Hazard Mapping</th>
<th>Required</th>
<th>Recommended</th>
<th>Not Required</th>
<th>Local Comp Plan</th>
<th>Required</th>
<th>Recommended</th>
<th>Not Required</th>
<th>Hazard Mitigation Plan</th>
<th>Required</th>
<th>Recommended</th>
<th>Not Required</th>
<th>Regional Comp Plan</th>
<th>Comments</th>
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<td><strong>County 100-Year Flood Map Included</strong></td>
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<td>Community Assessment</td>
<td>X</td>
<td>Chapter 2, Page 22</td>
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<td>Local Comp Plans</td>
<td>X</td>
<td>Chapter 1, Pages 12 - 15</td>
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<td>Not Included</td>
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<td><strong>Level of Detail:</strong> Poor/Good/Best</td>
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<tr>
<td><strong>County &lt; 100-Year Flood Map Included</strong></td>
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<tr>
<td><strong>City &lt; 100-Year Flood Map Included</strong></td>
<td>X</td>
<td>Not Included</td>
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<tr>
<td><strong>County Repetitive Loss Map</strong></td>
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<td>Not Included</td>
<td>X</td>
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<tr>
<td><strong>City Repetitive Loss Map</strong></td>
<td>X</td>
<td>Not Included</td>
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<td>Not Included</td>
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</table>

100-Year floodplain is provided for unincorporated area with location of incorporated jurisdictions provided. The level of detail is general for the overall county. The map was provided by the Carroll County GIS Department. A Floodplains Map is providing showing the 100-year and 100-year with base flood elevations. The Regionally Important Resources Map does not delineate the floodplain.

The level of detail for the County FRM is poor based on the ability to see how the floodplain intersects individual property parcels. This detail is based on a GIS map provided by the County. It is not the official Flood Insurance Rate Map. The map is a GIS-based and a source is not provided. Major roads and city limits are shown, but parcels are not.

100-Year floodplain Maps are provided for all incorporated municipalities and the level of detail is poor. The maps do not include any legends so it is difficult to tell if the floodplain information is accurate. Maps are not provided for four of the cities, two of which meet the “Minimal” state planning criteria and are not required to do so. The remaining maps are GIS-based. The GIS floodplain maps for the incorporated municipalities appear to be provided by the County. The detail is poor based on no underlying detail such as parcels, etc. And because there are no legends on the map it cannot be determined if the floodplain information is accurate. It is difficult to determine which properties in a community are subject to flooding. The actual Flood Insurance Rate Map was not provided. All maps are difficult to read. Floodplain layers and map labels are difficult to read. When road labels and parcel lines are provided, they are not very legible.

No other floodplain mapping is provided for the unincorporated area. No other floodplain mapping is provided for the unincorporated area.

No other floodplain mapping is provided for the incorporated areas. No other floodplain mapping is provided for the incorporated areas.

No repetitive loss mapping is provided for the unincorporated area. No repetitive loss mapping is provided for the unincorporated area.

No repetitive loss mapping is provided for the incorporated areas. No repetitive loss mapping is provided for the incorporated areas.
## Analysis

<table>
<thead>
<tr>
<th>Planning Process</th>
<th>Local Comp Plan</th>
<th>Hazard Mitigation Plan</th>
<th>Regional Comp Plan</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>County Planning Process</td>
<td>Public Participation Program (PPP)</td>
<td>Chapter 1, Pages 3 through 11</td>
<td>X</td>
<td>Stakeholder Involvement Program (GP)</td>
</tr>
<tr>
<td>City Planning Process</td>
<td>Local Comp Plans</td>
<td>Chapter 1, Pages 3 through 11</td>
<td>X</td>
<td>Stakeholder Involvement Program (GP)</td>
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</tbody>
</table>

There is a discussion of the County Planning Process which includes a purpose, planning methodology, plan organization and multi-jurisdictional considerations. The PPP describes the overall planning process. Planning process described in the EIP and Regional Assessment.

There is a discussion of the County Planning Process which includes a purpose, planning methodology, plan organization and multi-jurisdictional considerations. The plans summarizes the overall planning process.
Analysis

Results Incorporated Into Community Reports

- Major Report Sections
  - How To: Principals for Integrating Land Use Planning and Hazard Mitigation
    - Role of Local Plans
    - Public Participation in Planning Process
    - Planning Cycles & Updates
    - Mapping Makes a Difference
    - Existing Land Use Mapping
    - Future Land Use/Development Mapping
    - Integration: Tools & Techniques
Analysis

Results Incorporated Into Community Reports

• Major Report Sections

  – How To: Principals for Integrating Land Use Planning and Hazard Mitigation
  – Key Findings
  – Recommendations: Next Steps for Your Community and Regional Commission
## Analysis

### Example Review Checklist – Summary of Findings

<table>
<thead>
<tr>
<th>Topic</th>
<th>Hazard Mitigation Plan</th>
<th>Joint County/Cities Plan</th>
<th>Comprehensive Plan</th>
<th>Regional Plan</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard Mapping①</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>✔</td>
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<tr>
<td>Hazard Identification</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>✔</td>
<td>See pp. 12</td>
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<tr>
<td>Land Use Mapping②</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
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<tr>
<td>Land Use Discussion</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
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</tbody>
</table>

**Notes:**
- Better detail floodplain mapping is included in hazard mitigation plan; parcel data not included in comprehensive plan mapping. The FIRM is not included in any plan. No other hazard mapping is included that incorporates severe storms and tornadoes. The CSRA RC Regionally Important Resources Map does not delineate floodplains.
- Hazard mitigation plan has a more robust discussion of flood hazards; discussed in more general terms in the local comprehensive and regional plans.
- 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 county/cities are not parcel-based but contain a “Preserve” category which includes the floodplain. Road network is shown, and major roads are labeled. Regional plan provides a generalized “projected development patterns” map at the county level.
- Existing and future land use/development are more fully discussed in the local comprehensive plan than the other plans.
### Example Review Checklist – Summary of Findings

<table>
<thead>
<tr>
<th>Topic</th>
<th>Level of Detail</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Facilities Definition &amp; List</td>
<td>Medium</td>
<td>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 defined as critical facilities.</td>
</tr>
<tr>
<td>Infrastructure &amp; Utilities Definition &amp; List</td>
<td>Low</td>
<td>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. The hazard mitigation plan does not address infrastructure and utilities outside of the critical facilities discussion.</td>
</tr>
<tr>
<td>Planning Process Discussion (Timeline, no. of meetings &amp; use of media)</td>
<td>High</td>
<td>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 was used to educate and involve the public.</td>
</tr>
<tr>
<td>Planning Process Participants</td>
<td>High</td>
<td>All three plans identified participants in the planning process, including community officials and other stakeholders.</td>
</tr>
<tr>
<td>Review of Mitigation Measures</td>
<td>Low</td>
<td>All three plans excluded discussion of the mitigation measures and why certain approaches might be better than another to address the identified hazards and promote mitigation.</td>
</tr>
<tr>
<td>Vulnerable Population, Economy/Tax Base &amp; Cultural/Historic Resources Discussion</td>
<td>Medium</td>
<td>The hazard mitigation plan is lacking in all of these areas as compared to the detail provided in the local and regional comprehensive plans.</td>
</tr>
</tbody>
</table>
Analysis

Results – Comparative Checklists

Recommendations – Community Reports

Mitigation Best Practices - Results from Comparative Analysis Checklists and Recommendations from Community Reports
Outcomes

• **Issues**
  – Hazard Mapping
  – Land Use Mapping
  – Critical Facilities

• **Opportunities**
  – Parcels, Roads, Depth Grids, Hazus
  – Future Land Use, Parcels, Roads, Floodplain Designation
  – Standard Definition (critical, essential, community)
Outcomes

• **Issues**
  – Infrastructure & Utilities
  – Goals
  – Mitigation Alternatives

• **Opportunities**
  – Standard Definition
  – Alignment/Coordination
  – Comprehensive Review
Outcomes

- Integration
  - FEMA/APA
  - GA DCA and GEMA
  - Reduced funding for Mitigation Planning
  - Planning Process
  - Hazard or Safety Element
Outcomes

Natural Hazards Element

Data current as of January 2010
Outcomes

• Effective Integration of Hazard Mitigation

  - Occurs when a community’s planning framework leads to development patterns that do not increase risk from known hazards or leads to redevelopment that reduces risk from known hazards
Georgia Disaster Resilient Building Code

Appendix N
Disaster Resilient Construction
Based on IBC 2012 Edition
Available for adoption Jan 1, 2013

Appendix R
Disaster Resilient Construction
Based on IRC 2012 Edition
Available for adoption Jan 1, 2013
Implementation

American Planning Association
Georgia Chapter
Making Great Communities Happen

GPA Spring Conference
May 1, 2013

Principles for Integrating Planning for
Hazard Mitigation and Land Use
Community Planning Institute (CPI)

Principles for Integrating Planning for Hazard Mitigation and Land Use provides an overview of the importance of planning to enable quicker recovery from future natural disaster events. This session includes best practices for hazard mitigation in the context of land use planning (including GIS mapping), and discussion of proposed model zoning code sections and how to apply them. It explains the benefits of proactive land use planning by local governments to both enable better recovery efforts and diminish the negative impacts of such a hazard event on your community.

Upcoming Workshops

<table>
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<tr>
<th>Dates</th>
<th>Locations</th>
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<tr>
<td>June 25</td>
<td>Rome</td>
<td>Click Here to Register</td>
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<tr>
<td>9:00-3:00</td>
<td>Rome Civic Center</td>
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<tr>
<td>July 17</td>
<td>Macon</td>
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<tr>
<td>9:00-3:00</td>
<td>Central GA Technical College</td>
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<tr>
<td>July 18</td>
<td>Jekyll Island</td>
<td>Click Here to Register</td>
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<tr>
<td>9:00-3:00</td>
<td>Villas by the Sea Resort &amp; Conference Center</td>
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Questions

- David Stroud, CFM
david.stroud@amec.com