# 7 CAPABILITY ASSESSMENT

This section of the Plan discusses the capability of Mecklenburg County and participating municipal jurisdictions to implement hazard mitigation activities. The *Capability Assessment* section consists of the following six subsections:

- WHAT IS A CAPABILITY ASSESSMENT?
- CONDUCTING THE CAPABILITY ASSESSMENT
- CAPABILITY ASSESSMENT FINDINGS
- PREVIOUSLY IMPLEMENTED MITIGATION MEASURES
- CONCLUSIONS ON LOCAL CAPABILITY
- LINKING THE CAPABILITY AND RISK ASSESSMENTS TO THE MITIGATION STRATEGY

## WHAT IS A CAPABILITY ASSESSMENT?

The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a comprehensive mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.[1] As in any planning process, it is important to try to establish which goals and actions are feasible, based on an understanding of the organizational capacity of those agencies or departments tasked with their implementation. A capability assessment helps to determine which mitigation actions are practical and likely to be implemented over time given a local government's planning and regulatory framework, level of administrative and technical support, amount of fiscal resources, and current political climate.

A capability assessment has two primary components: an inventory of a local jurisdiction's relevant plans, ordinances or programs already in place and an analysis of its capacity to carry them out. A careful examination of local capabilities will detect any existing gaps, shortfalls or weaknesses associated with ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate hazard vulnerability. A capability assessment also highlights the positive mitigation measures already in place or being implemented at the local government level, which should continue to be supported and enhanced if possible through future mitigation efforts.

The capability assessment serves as a critical part of the planning process, including the development of an effective multi-jurisdictional hazard mitigation strategy. Coupled with the Risk Assessment, the *Capability Assessment* section helps identify and target meaningful mitigation actions for incorporation into the *Mitigation Strategy*. It not only helps establish the goals for Mecklenburg County to pursue under this Plan, but also ensures that those goals and the mitigation actions that follow are realistically achievable given local conditions.

[1] While the Interim Final Rule for implementing the Disaster Mitigation Act of 2000 does not require a local capability assessment to be completed for local hazard mitigation plans, it is a critical step to develop a mitigation strategy that meets the needs of each jurisdiction while taking into account their own unique abilities. The Rule does state that a community's mitigation strategy should be "based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools" (44 CFR, Part 201.6(c)(3)). Further, the State of North Carolina Division of Emergency Management recommends a local capability assessment to be completed for local hazard mitigation plans.

# CONDUCTING THE CAPABILITY ASSESSMENT

In order to facilitate the inventory and analysis of local government capabilities throughout Mecklenburg County, a detailed *Capability Assessment Survey*[2] was distributed to Mecklenburg County's departments and local municipal jurisdictions. The survey questionnaire, which was completed by local government officials in 2005 and again during the 2010 plan update process, requested information on a variety of "capability indicators" such as existing local plans, policies, programs or ordinances that may reduce, or in some circumstances, increase the community's hazard vulnerability. Other indicators included information related to each jurisdiction's fiscal, administrative and technical capabilities such as access to local budgetary and personnel resources necessary to implement mitigation measures. Survey respondents were also asked to comment on the current political climate in their jurisdiction to implement mitigation actions, an important consideration for any local planning or decision making process.

At a minimum, survey results provide an extensive inventory of existing local plans, ordinances, programs and resources in place or under development in addition to their overall effect on hazard loss reduction. Local officials were also required to conduct a self-assessment of their jurisdiction's specific capabilities. The survey instrument thereby not only helps to accurately assess each jurisdiction's degree of local capability, but also serves as a good source of introspection for those jurisdictions wishing to improve their capability as identified gaps, weaknesses or conflicts can be recast as opportunities to implement specific mitigation actions.

The information provided by participating jurisdictions was incorporated into a database for further analysis. A general scoring methodology[3] was then applied to quantify and rank each jurisdiction's overall capability relative to one another. According to the scoring system, each indicator was assigned a point value based on its relevance to hazard mitigation. Additional points were added based on each jurisdiction's self-assessment of their own planning and regulatory capability, administrative and technical capability, fiscal capability and political capability.

A general capability rating of "High," "Moderate" or "Limited" was then determined for each jurisdiction according to the total number of points received. These classifications are designed to provide a general assessment of each individual jurisdiction's local capability relative to one another. In combination with the narrative responses provided by local officials, the results of this multi-jurisdictional capability assessment lend critical information for developing an effective and meaningful mitigation strategy.

# CAPABILITY ASSESSMENT FINDINGS

The findings of the 2010 capability assessment are summarized in this Plan in order to provide insight into the abilities of participating jurisdictions to implement a feasible hazard mitigation strategy. All information is based upon the input provided by local government officials through the *Capability Assessment Survey* and during meetings of the Mitigation Planning Committee.

## PLANNING AND REGULATORY CAPABILITY

Planning and regulatory capability is based on the implementation of plans, ordinances and programs that demonstrate a local jurisdiction's commitment to guiding and managing growth, including reconstruction

[2] The *Capability Assessment Survey* instrument used to assess county and municipal capabilities, as well as individual surveys completed by participating jurisdictions are available through Mecklenburg County upon request.
[3] The scoring methodology used to quantify and rank each jurisdiction's capability is fully described in this section of the Plan.

following a disaster. Examples include emergency response, mitigation and recovery planning, comprehensive land use planning, transportation planning and capital improvements planning. Additional examples include the enforcement of zoning or subdivision ordinances and building codes that regulate how land is developed and structures are built. These planning initiatives present significant opportunities to integrate hazard mitigation principles and practices into the local decision making process.

This assessment is designed to provide a general overview of the key planning and regulatory tools in place or under development for jurisdictions in Mecklenburg County, along with their potential effect on hazard loss reduction. This information will help identify opportunities to address existing gaps, weaknesses or conflicts with other initiatives in addition to integrating the implementation of this Plan with existing planning mechanisms, where appropriate.

**Table 7.1** provides a summary of the relevant local plans, ordinances and programs already in place or under development for Mecklenburg County's participating local governments. A checkmark indicates (✓) that the item is currently in place and being implemented and integrated by the local jurisdiction (or in some cases by the County on Behalf of that jurisdiction), or that is currently under development.

**Table 7.1: Relevant Plans, Ordinances and Programs**

| JURISDICTION | Hazard Mitigation Plan | Comprehensive Land Use Plan | Floodplain Management Plan | Open Space Management Plan | Stormwater Management Plan | Emergency Operations Plan | SARA Title III Plan | Radiological Emergency Plan | Continuity of Operations Plan | Evacuation Plan | Disaster Recovery Plan | Capital Improvements Plan | Economic Development Plan | Historic Preservation Plan | Flood Damage Prevention Ordinance | Zoning Ordinance | Subdivision Ordinance | Unified Development Ordinance | Post-disaster Redevelopment / Recovery Ordinance | Building Code | Fire Code | NFIP | NFIP Community Rating System |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mecklenburg County | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Charlotte | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Cornelius | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Davidson | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | |
| Huntersville | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | |
| Matthews | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Mint Hill | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Pineville | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ |

A more detailed discussion of each jurisdiction's planning and regulatory capability follows, along with the incorporation of additional information based on the narrative comments provided by local officials in response to the survey questionnaire.

## Emergency Management

Hazard mitigation is widely recognized as one of the four primary phases of emergency management. The three other phases include preparedness, response and recovery. In reality, each phase is interconnected with hazard mitigation as **Figure 7.1** suggests. Opportunities to reduce potential losses through mitigation practices are ideally implemented before a disaster strikes. Examples include the acquisition or elevation of flood-prone structures or the enforcement of regulatory policies that prevent construction in known hazard areas. In reality, the post-disaster environment provides another important "window of opportunity" to implement hazard mitigation projects and policies. During this time period, federal disaster assistance, including the Hazard Mitigation Grant Program (HMGP), may be available. In addition, elected officials and disaster victims may be more willing to implement mitigation measures in order to avoid similar events occurring in the future.

**Figure 7.1: Four Phases of Emergency Management**


*Sources: Federal Emergency Management Agency; PBS&J*

Planning for each phase is a critical part of a comprehensive emergency management program and a key to the successful implementation of hazard mitigation actions. As a result, the *Capability Assessment Survey* asked several questions across a range of emergency management plans in order to assess each jurisdiction's willingness to plan and their level of technical planning proficiency.

*Hazard Mitigation Plan*: A hazard mitigation plan represents a community's blueprint for how it intends to reduce the impact of natural and human-caused hazards on people and the built environment. The essential elements of a hazard mitigation plan include a risk assessment, capability assessment and mitigation strategy.

- All local incorporated jurisdictions in Mecklenburg County actively participated in the development of the initial Multi-jurisdictional Hazard Mitigation Plan in 2005 and again during the 2010 plan update process. This Plan assesses all natural hazard threats facing the area and the local capabilities to reduce their potential impact, and through ongoing intergovernmental coordination establishes countywide mitigation goals and individual mitigation actions plans aimed at reducing future losses to natural hazards.

- Mecklenburg County has prepared and adopted 10 Watershed Flood Mitigation Plans. The watersheds encompass approximately 85 percent of flood-prone buildings in the Charlotte-Mecklenburg area. While the watershed plans do not meet the requirements established by the Disaster Mitigation Act of 2000, they have been incorporated into this Multi-jurisdictional Hazard Mitigation Plan, which is designed to meet all federal and state hazard mitigation planning rules and regulations. The flood hazard analysis and flood mitigation projects identified in the watershed plans represent a strong commitment to flood loss reduction in the county. The Plan will build on the work already completed to include an assessment of all natural hazards and the identification of specific measures intended to reduce their impact.

*Disaster Recovery Plan*: A disaster recovery plan serves to guide the physical, social, environmental and economic recovery and reconstruction process following a disaster. In many instances, hazard mitigation principles and practices are incorporated into local disaster recovery plans with the intent of capitalizing on opportunities to break the cycle of repetitive disaster losses. Disaster recovery plans can also lead to the preparation of disaster redevelopment policies and ordinances to be enacted following a hazard event.

- The practice of disaster recovery is generally covered in the Charlotte-Mecklenburg County Integrated Response Plan for All Hazards. The Response Plan is prepared and maintained by the staff of the Charlotte-Mecklenburg Emergency Management Office (CMEMO) in coordination with other city and county departments. Initially adopted in 1953, the plan was amended in June 2004. The plan clearly delineates roles and responsibilities to support accountability and liability and enhance public safety in response to a disaster. While the plan strongly addresses emergency operations that will foster a prompt, efficient and coordinated response to a disaster, it does not fully address long-term recovery and reconstruction.

- All jurisdictions have indicated that guidelines for local disaster recovery procedures and operations are coordinated through CMEMO as an annex to the Integrated Response Plan for All Hazards.

- The preparation of a countywide disaster recovery plan should be considered by the Mitigation Planning Committee as a potential mitigation action to propose in this Plan's *Mitigation Strategy* or through future Plan updates. Mecklenburg County is aware of the State-sponsored pilot disaster recovery planning initiative in Brunswick County and will evaluate the possibility of preparing its own multi-jurisdictional recovery plan following a review of that effort and forthcoming tools from the North Carolina Emergency Management (NCEM).

*Emergency Operations Plan*: An emergency operations plan outlines responsibilities and the means by which resources are deployed during and following an emergency or disaster.

- All municipal jurisdictions are covered under the Mecklenburg County All Hazards Plan and cooperate accordingly, although some have also prepared their own local emergency operations plans. These include the municipalities of Matthews (draft complete, now under review), Huntersville and Davidson.

- The All Hazards Plan has been determined to have a moderate effect on loss reduction, as its emphasis focuses on preparedness and response operations versus hazard mitigation activities.

*Continuity of Operation Plan*: A continuity of operations plan establishes a clear chain of command, line of succession and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster event.

- Survey results indicate three (3) jurisdictions, Mecklenburg County, the City of Charlotte and Town of Huntersville, have continuity of operations plans in place or under development. The other municipal jurisdictions have indicated they fall under procedures identified in the Charlotte-Mecklenburg County All Hazards Plan; however do not have their own stand-alone continuity of operations plan.

*Radiological Emergency Plan*: A radiological emergency plan delineates roles and responsibilities for assigned personnel and the means to deploy resources in the event of a radiological accident.

- The McGuire Nuclear Power Station is located in Mecklenburg County. Radiological hazards are addressed in the Duke Power Company's Emergency Response Plan on behalf of all jurisdictions in Mecklenburg County. The plan prescribes those actions to be taken by Mecklenburg County and threatened municipalities in order to protect the health and safety of the general public who may be affected by radiation exposure and environmental contamination resulting from an accident or terrorist attack at the McGuire site.

- Radiological hazards are also addressed in the Charlotte-Mecklenburg County Integrated Response Plan for All Hazards.

*SARA Title III Emergency Response Plan*: A SARA Title III Emergency Response Plan outlines the procedures to be followed in the event of a chemical emergency such as the accidental release of toxic substances. These plans are required by federal law under Title III of the Superfund Amendments and Re-authorization Act (SARA), and the Emergency Planning and Community Right-to-Know Act (EPCRA).

- An Emergency Response Plan for chemical emergencies throughout the county is addressed in Annex P of the Mecklenburg County All Hazards Plan. A comprehensive rewrite of the Annex was completed and adopted in June 2004.

- The Local Emergency Planning Committee (LEPC) is a sub-committee of the Charlotte Mecklenburg All Hazards Advisory Committee (AHAC). A variety of local government officials, chemical industry representatives and media outlets participate in the LEPC planning process per EPCRA requirements.

## General Planning

The implementation of hazard mitigation activities involves departments and individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists and others. In many instances, concurrent local planning efforts may complement hazard mitigation goals even though they are not designed as such. Therefore, the *Capability*

*Assessment Survey* also asked questions regarding each jurisdiction's general planning capabilities and the degree to which hazard mitigation is integrated into other planning efforts. The results of this survey are outlined below, along with the general findings of a separate section incorporated into the Plan during the 2010 plan update that addresses the degree to which local planning mechanisms are currently being used by each jurisdiction to achieve "safe growth" according to another separately completed survey.

*Comprehensive Land Use Plan*: A comprehensive land use plan establishes the overall vision for what a community wants to be and a guide to future governmental decision making. Typically a comprehensive plan is comprised of demographic conditions, land use patterns, transportation elements and proposed community facilities. Given the broad nature of the plan and its regulatory standing in many communities, the integration of hazard mitigation measures into the comprehensive plan can serve as a far reaching, long-term risk reduction tool.

- Survey results indicate that all jurisdictions possess a comprehensive land use plan in addition to other growth and development-related policy documents. As described in Section 3: *Community Profile* local jurisdictions in Mecklenburg County are committed to managing growth in a responsible and often cooperative manner. Some jurisdictions maintain small area plans addressing specific issues and concerns. All participating municipalities indicated that their land use plans either strongly support or help facilitate hazard loss reduction and are periodically updated.

- The Town of Matthews reports that its comprehensive plan is currently undergoing a rewrite as a unified development ordinance.

*Capital Improvements Plan*: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public investment in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- Survey results indicate that seven (7) out of eight (8) jurisdictions have a capital improvements plan in place or under development. Most are five-year plans that are updated annually. All survey respondents indicated that capital improvement plans either support or facilitate loss reduction efforts in their community. In the City of Charlotte, various departments prepare plans depending on the type of capital improvement program they maintain. For example, the City of Charlotte Storm Water Services division addresses flood control projects.

- The Town of Mint Hill reportedly does not have a capital improvements plan currently in place.

*Historic Preservation Plan*: A historic preservation plan is intended to preserve historic structures or districts within a community. An often overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages.[4] This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards, or are within a historic district that cannot easily be relocated out of harm's way.

- Survey results indicate that six (6) out of eight (8) jurisdictions have completed a stand-alone historic preservation plan with rules and regulations that govern those properties (and

[4] See *Protecting the Past from Natural Disasters*. 1989. Nelson, Carl. National Trust for Historic Preservation: Washington, D.C.

neighborhoods) included in their local inventory and listed on the National Register of Historic Places.

- The towns of Huntersville and Mint Hill do not currently have a historic preservation plan in place.

*Zoning Ordinances*: Zoning represents the primary means by which land use is controlled by local governments. As part of a community's police power, zoning is used to protect the public health, safety and welfare of those in a given area. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas.

- Survey results indicate that all jurisdictions in Mecklenburg County have adopted and enforce a zoning ordinance. All jurisdictions indicated that their zoning ordinance either strongly supports or helps facilitate hazard loss reduction.

- The towns of Cornelius, Matthews and Mint Hill indicated that they currently administer their zoning and subdivision regulations through a locally adopted Unified Development Ordinance.

*Subdivision Ordinances*: A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.[5]

- Survey results indicate that all jurisdictions in Mecklenburg County have adopted and enforce a subdivision ordinance. All jurisdictions indicated that their ordinance either strongly supports or helps facilitate hazard loss reduction, with some intending to strengthen their ordinance through proposed mitigation actions as part of this Plan.

- The towns of Cornelius, Matthews and Mint Hill indicated that they currently administer their zoning and subdivision regulations through a locally adopted Unified Development Ordinance.

*Building Codes, Permitting and Inspections*: Building Codes regulate construction standards. In many communities, permits are issued for, and inspections of work take place on, new construction. Decisions regarding the adoption of building codes (that account for hazard risk), the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- Per the General Assembly, communities in North Carolina are required to follow a statewide mandatory building code. The 2009 North Carolina Building Code is based on the 2006 International Building Code (IBC), with heavy modifications being made by the North Carolina Building Code Council (although few related to life and safety issues). Local governments may also amend the code pursuant to state approval.

- Mecklenburg County performs building code enforcement for all municipal jurisdictions.

The adoption and enforcement of building codes by local jurisdictions is routinely assessed through the Building Code Effectiveness Grading Schedule (BCEGS) program developed by the Insurance Services

[5] For additional information regarding the use of subdivision regulations in reducing flood hazard risk, see *Subdivision Design in Flood Hazard Areas*. 1997. Planning Advisory Service Report Number 473. American Planning Association: Washington, D.C.

Office, Inc. (ISO).[6] Under the BCEGS program, ISO assesses the building codes in effect in a particular community and how the community enforces its building codes, *with special emphasis on mitigation of losses from natural hazards*. The results of BCEGS assessments are routinely provided to ISO's member private insurance companies, which in turn may offer ratings credits for new buildings constructed in communities with strong BCEGS classifications.

In conducting the assessment, ISO collects information related to personnel qualifications and continuing education as well as the number of inspections performed per day. This type of information, combined with local building codes, is used to determine a grade for that jurisdiction. The grades range from 1 to 10, with the lower grade being more ideal. A BCEGS grade of 1 represents an exemplary commitment to building code enforcement, and a grade of 10 indicates less than a minimum level of recognized protection.

- Building code enforcement, which is handled by Mecklenburg County for all jurisdictions, has received a BCEGS rating of "4" for personal lines and an exemplary BCEGS rating of "1" for commercial and industrial lines.

***2010 Safe Growth Survey***

As part of the 2010 plan update process, each jurisdiction was also asked to complete a *Safe Growth Survey*. This unique survey instrument was drawn from a technique proposed by David Godschalk, FAICP and professor emeritus of city and regional planning at the University of North Carolina at Chapel Hill, to help local better evaluate the extent to which each local jurisdiction in Mecklenburg County is positioned to grow safely relative to its natural hazards. The survey was completed by appropriate planning, zoning and/or community development staff for each of jurisdiction and the results are summarized in **Table 7.2**. In completing the survey each respondent was asked to indicate how strongly they agree or disagree with the "Safe Growth Statements" as they relate to their own jurisdiction's current plans, policies and programs for guiding future community growth and development, according to the following scale:

**1** = Strongly Disagree **2** = Somewhat Disagree **3** = Neutral **4** = Somewhat Agree **5** = Strongly Agree

**Table 7.2: Results of 2010 Safe Growth Survey**

| Safe Growth Statement | Mecklenburg County* | Charlotte* | Cornelius | Davidson** | Huntersville | Matthews | Mint Hill | Pineville |
|---|---|---|---|---|---|---|---|---|
| **COMPREHENSIVE PLAN** | | | | | | | | |
| The comprehensive plan includes a future land use map that clearly identifies natural hazard areas. | 5 | 5 | 1 | | 5 | 2 | 4 | 5 |
| Current land use policies discourage development and/or redevelopment within natural hazard areas. | 5 | 5 | 5 | | 5 | 4 | 5 | 5 |
| The comprehensive plan provides adequate space for expected future growth in areas located outside of natural hazard areas. | 5 | 5 | 1 | | 5 | 4 | 4 | 5 |
| **Transportation** | | | | | | | | |
| The transportation element limits access to natural hazard areas. | 3 | 3 | 4 | | 5 | 3 | 4 | 3 |
| Transportation policy is used to guide future growth and development to safe locations. | 4 | 4 | 4 | | 5 | 3 | 4 | 3 |

[6] Participation in BCEGS is voluntary and may be declined by local governments if they do not wish to have their local building codes evaluated.

## Table 7.2: Results of 2010 Safe Growth Survey

| Safe Growth Statement | Mecklenburg County* | Charlotte* | Cornelius | Davidson** | Huntersville | Matthews | Mint Hill | Pineville |
|---|---|---|---|---|---|---|---|---|
| Transportation systems are designed to function under disaster conditions (e.g., evacuation, mobility for fire/rescue apparatus, etc.). | 5 | 5 | 3 | | 3 | 3 | 3 | 3 |
| **Environmental Management** | | | | | | | | |
| Environmental features that serve to protect development from hazards (e.g., wetlands, riparian buffers, etc.) are identified and mapped. | 4 | 4 | 5 | | 5 | 3 | 4 | 5 |
| Environmental policies encourage the preservation and restoration of protective ecosystems. | 5 | 5 | 4 | | 5 | 3 | 4 | 5 |
| Environmental policies provide incentives to development that is located outside of protective ecosystems. | 4 | 4 | 1 | | 3 | 3 | 3 | 3 |
| **Public Safety** | | | | | | | | |
| The goals and policies of the comprehensive plan are related to and consistent with those in the Mecklenburg County Multi-jurisdictional Hazard Mitigation Plan. | 4 | 4 | 2 | | 5 | 3 | 4 | 4 |
| Public safety is explicitly included in the plan's growth and development policies. | 3 | 3 | 4 | | 5 | 3 | 4 | 4 |
| The monitoring and implementation section of the plan covers safe growth objectives. | 3 | 3 | 4 | | 5 | 3 | 4 | 4 |
| **ZONING ORDINANCE** | | | | | | | | |
| The zoning ordinance conforms to the comprehensive plan in terms of discouraging development and/or redevelopment within natural hazard areas. | 5 | 5 | 4 | | 5 | 5 | 4 | 5 |
| The ordinance contains natural hazard overlay zones that set conditions for land use within such zones. | 5 | 5 | 4 | | 5 | 3 | 4 | 3 |
| Rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use. | 4 | 4 | 2 | | 5 | 4 | 3 | 2 |
| The ordinance prohibits development within, or filling of, wetlands, floodways, and floodplains. | 4 | 4 | 5 | | 5 | 5 | 5 | 5 |
| **SUBDIVISION REGULATIONS** | | | | | | | | |
| The subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas. | 4 | 4 | 2 | | 5 | 4 | 4 | 2 |
| The regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources. | 5 | 5 | 5 | | 5 | 3 | 3 | 1 |
| The regulations allow density transfers where hazard areas exist. | 5 | 5 | 1 | | 1 | 2 | 4 | 1 |
| **CAPITAL IMPROVEMENT PROGRAM AND INFRASTRUCTURE POLICIES** | | | | | | | | |
| The capital improvement program limits expenditures on projects that would encourage development/redevelopment in areas vulnerable to natural hazards. | 4 | 4 | 4 | | 5 | 3 | 4 | 4 |
| Infrastructure policies limit the extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards. | 5 | 5 | 4 | | 5 | 3 | 4 | 4 |
| The capital improvements program provides funding for hazard mitigation projects identified in the Mecklenburg County Multi-jurisdictional Hazard Mitigation Plan. | 5 | 5 | 1 | | 3 | 3 | 4 | 2 |
| **OTHER** | | | | | | | | |
| Small area or corridor plans recognize the need to avoid or mitigate natural hazards. | 5 | 5 | 5 | | 5 | 4 | 3 | 5 |
| The building code contains provisions to strengthen or elevate new or substantially improved construction to withstand hazard forces. | 5 | 5 | 4 | | 5 | 4 | 3 | 5 |

**Table 7.2: Results of 2010 Safe Growth Survey**

| Safe Growth Statement | Mecklenburg County* | Charlotte* | Cornelius | Davidson** | Huntersville | Matthews | Mint Hill | Pineville |
|---|---|---|---|---|---|---|---|---|
| Economic development/redevelopment strategies include provisions for mitigating natural hazards or otherwise enhancing social and economic resiliency to hazards. | 5 | 5 | 4 | | 1 | 3 | 4 | 4 |
| **AVERAGE SURVEY RATINGS** | **4.4** | **4.4** | **3.3** | | **4.4** | **3.3** | **3.8** | **3.7** |

** Responses submitted jointly for the City of Charlotte and Mecklenburg County by the Charlotte-Mecklenburg Planning Department, a joint city-county agency charged with guiding growth and development for the City of Charlotte and the surrounding region*
*** As of this writing, the Safe Growth Survey had yet to be returned for the Town of Davidson.*

While somewhat of a subjective exercise, the *Safe Growth Survey* used to provide some quantitative measures of how adequately existing planning mechanisms and tools for each jurisdiction were being used to address the notion of safe growth as currently advocated by organizations such as FEMA and the American Planning Association (APA). In addition, the survey instrument was aimed at further integrating the subject of hazard risk management into the dialogue of local planners throughout Mecklenburg County and to possibly consider and identify new mitigation actions as it relates to those local planning policies or programs already in place. It is anticipated that the survey will be used again during future plan updates to help measure progress over time and to continue identifying possible mitigation actions as it relates to future growth and community development practices, and how such actions may better be incorporated into local planning mechanisms.

### Floodplain Management

Flooding represents the greatest natural hazard facing the nation. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. In addition to approaches that cut across hazards, such as education, outreach, and the training of local officials, the *National Flood Insurance Program* (NFIP) contains specific regulatory measures that enable government officials to determine where and how growth occurs relative to flood hazards. Participation in the NFIP is voluntary, but is promoted by FEMA as a crucial means to implement and sustain an effective hazard mitigation program.

In order for a county or municipality to join the NFIP, they must adopt a local flood damage prevention ordinance that requires jurisdictions to follow established minimum building standards in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by the 100-year flood, and that new floodplain development will not aggravate existing flood problems or increase damage to other properties.

Another key service provided by the NFIP is the mapping of identified flood hazard areas. Once prepared, the Flood Insurance Rate Maps (FIRMs) are used to assess flood hazard risk, regulate construction practices and set flood insurance rates. FIRMs are an important source of information to educate residents, government officials and the private sector about the likelihood of flooding in their community.

**Table 7.3** summarizes NFIP participation for each of Mecklenburg County's local jurisdictions along with general NFIP policy data.[7]

[7] General NFIP policy data (number and coverage) is current as of 12/31/2009 and is provided by the Federal Emergency Management Agency.

**Table 7.3: NFIP Participation in Mecklenburg County**

| JURISDICTION | NFIP ENTRY DATE | CURRENT EFFECTIVE MAP | NUMBER OF POLICIES | AMOUNT OF COVERAGE |
|---|---|---|---|---|
| Mecklenburg County | 06/01/1981 | 03/02/09 | 773 | $187,549,000 |
| Charlotte | 08/15/1978 | 03/02/09 | 2,349 | $524,405,400 |
| Cornelius | 09/30/1997 | 03/02/09 | 73 | $22,705,300 |
| Davidson | 10/16/1997 | 03/02/09 | 59 | $10,070,900 |
| Huntersville | 02/04/2004 | 03/02/09 | 56 | $16,802,900 |
| Matthews | 02/04/2004 | 03/02/09 | 41 | $11,814,100 |
| Mint Hill | 12/21/2007 | 03/02/09 | 17 | $3,874,600 |
| Pineville | 03/18/1987 | 03/02/09 | 41 | $10,255,900 |

*Sources: Federal Emergency Management Agency (as of 12/31/2009)*

When it comes to floodplain management, the City of Charlotte and Mecklenburg County are among the most ambitious and progressive local governments in the United States. As eluded to throughout other sections of this Plan, they routinely coordinate on stormwater and flood-related issues and have long since gone above and beyond the minimum regulatory standards of the NFIP. This includes developing and adopting community floodplain maps that go beyond FEMA's standard for mapping only current flood risk but *future* floodplain conditions based on anticipated growth and development that will likely increase those risks. Further, they have coordinated with each of the other municipal jurisdictions in Mecklenburg County to consider and adopt higher regulatory standards through their own flood damage prevention ordinances. **Table 7.4** provides a brief description of the higher regulatory standards adopted in Mecklenburg County, and **Table 7.5** summarizes which of these higher standards are currently being enforced in each jurisdiction according to local ordinances.

**Table 7.4: NFIP Higher Regulatory Standards in Mecklenburg County**

| HIGHER STANDARD | DESCRIPTION | BENEFITS | FEMA MINIMUMS |
|---|---|---|---|
| Parking Lots Must be Elevated | • Applies to parking spaces for new non-single family buildings<br>• Flood depths no more than 6 inches deep in any parking space during Community Flood event. | • Vehicles will be safe from flood damage<br>• Water quality benefits<br>• Emergency response to vehicles reduced | N/A |
| Dry land Access | • Driveways to new or substantially improved buildings must be elevated above the Community Base Flood Elevation and must connect to a public street above the Community Base Flood Elevation<br>• Exemptions available when no dry public street<br>• Variance are allowed | • This ensures safe access for regular and emergency vehicles to buildings | N/A |

**Table 7.4: NFIP Higher Regulatory Standards in Mecklenburg County**

| HIGHER STANDARD | DESCRIPTION | BENEFITS | FEMA MINIMUMS |
|---|---|---|---|
| **Flood Maps**<br><br>Community Floodplains (Future Conditions)<br><br><br>Wider Floodways | • Current maps show floodplain areas based on future land use conditions.<br>• New buildings must be built with the lowest floor elevated at least one foot above the Community (Future) Base Flood Elevation.<br>• Wider floodways are shown, which are areas on the maps reserved to allow the free flow of floodwaters while limiting development in these areas. | • New Buildings will be constructed so that they will not incur damage from higher flood levels in the future.<br>• Less floodplain area will be filled or built upon | • Map the existing conditions 100-year floodplain.<br>• Lowest floors allowed at existing conditions base flood elevation<br>• More floodplain area can be built upon (wider floodways) |
| Critical Facilities Located Out of 500-year Floodplain | • New Critical Facilities such as daycare facilities, nursing homes, schools, hospitals, fire, police and medic facilities etc, must be located above the 500-year flood level. | • Vulnerable facilities or facilities essential to the community will be less at risk. | N/A |
| Levee Restrictions | • Many restrictions regarding construction of levees | • Likelihood of levees being constructed will be small resulting in less potential damage that could occur from levee failure. | N/A |
| Higher floor elevation requirement (Freeboard) | • Floors of new or substantially improved buildings must be elevated at least one (1) foot above the Community (future). (2 feet on Catawba) | • This will provide an extra degree of safety for factors not accounted for in the mapping such as, stream blockages, sedimentation in culverts, and inaccuracies in the mapping models. | • FEMA allows construction at existing conditions base flood elevations |
| Cumulative Substantial/Damage Improvement | • Improvements costing over 25% of the building value are cumulated within a 10-year period to meet the 50% maximum improvement value requirement. | • Buildings will be brought up to compliance and made safer in a shorter time period. | • Value only counted from one damage event or building improvement greater than 50% of the value of the structure |
| Below Flood Level Basements Not Allowed on Filled Lots | • Basement floors of new buildings cannot be located below the Community Base Flood Elevation on lots that have been elevated by fill | • Prevents possible damage from groundwater infiltration and meets FEMA recommendation. | • Encourages communities to meet this standard, but not required. |

**Table 7.5: NFIP Higher Regulatory Standards in Mecklenburg County, by Jurisdiction**

| REGULATION | Mecklenburg County | Charlotte | Cornelius | Davidson | Huntersville | Matthews | Mint Hill | Pineville |
|---|---|---|---|---|---|---|---|---|
| Parking Lots Must be Elevated | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Dry land Access | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Community Floodplains (Future Conditions) | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Wider Floodways | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Critical Facilities Located Out of 500-year Floodplain | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Levee Restrictions | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Higher floor elevation requirement (freeboard) | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ |
| Cumulative Substantial/Damage Improvement | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Below Flood Level Basements Not Allowed on Filled Lots | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| No Development In FEMA Floodplain | ✓ | ✓ | | | | ✓ | ✓ | ✓ |

An additional indicator of floodplain management capability is the active participation of local jurisdictions in the *Community Rating System* (CRS). The CRS is an incentive-based program that encourages counties and municipalities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP, adding extra local measures to provide protection from flooding. All of the 18 creditable CRS mitigation activities are assigned a range of point values. As points are accumulated and identified thresholds are reached, communities can apply for an improved CRS class rating. Class ratings, which run from 10 to 1, are tied to flood insurance premium reductions as shown in **Table 7.6**. As class ratings improve (decrease), the percent reduction in flood insurance premiums for NFIP policy holders in that community increases.

**Table 7.6: CRS Premium Discounts, By Class**

| CRS CLASS | PREMIUM REDUCTION |
|---|---|
| 1 | 45% |
| 2 | 40% |
| 3 | 35% |
| 4 | 30% |
| 5 | 25% |
| 6 | 20% |
| 7 | 15% |
| 8 | 10% |
| 9 | 5% |
| 10 | 0 |

*Source: Federal Emergency Management Agency*

Community participation in the CRS is voluntary. Any community that is in full compliance with the rules and regulations of the NFIP may apply to FEMA for a CRS classification better than class 10. The CRS

application process has been greatly simplified over the past several years in order to make the program more user friendly, and extensive technical assistance is available for communities who request it.

- Mecklenburg County (Class 6), the City of Charlotte (Class 5) and the Town of Pineville (Class 6) actively participate in the CRS and are aiming to increase their CRS rating through the completion of this plan update process in addition to the implementation of other recommended mitigation actions. It is anticipated that additional jurisdictions may also seek to join the CRS as a result of this plan update process and following their own evaluation procedures.

*Floodplain Management Plan*: A floodplain management plan (or a flood mitigation plan) provides a framework for the identification and implementation of corrective and preventative measures designed to reduce flood-related impacts.

- Survey results indicate that all jurisdictions in Mecklenburg County are covered under the County's floodplain management plan that supports flood loss reduction efforts. The Town of Matthews has indicated that it also has adopted its own floodplain management plan in cooperation with County staff. The jurisdictions also cited flood damage prevention ordinances, policies and codes that are in place or under development as part of other community planning and regulatory programs.

*Open Space Management Plan:* An open space management plan is designed to preserve, protect and restore largely undeveloped lands, and to expand or connect areas in the public domain, including parks, greenways and other outdoor recreation areas. In many instances open space management practices are consistent with the goals of reducing hazard losses, such as the preservation of wetlands or other flood-prone areas in their natural state.

- Survey results indicate that all jurisdictions in the county except the Town of Mint Hill (which is covered under some County efforts) have prepared or are preparing their own open space management plan or a similar plan (i.e., Greenway Master Plan or Conservation and Downtown Plan) that addresses open space. Mecklenburg County Stormwater Services, working with other county agencies, has closely linked the acquisition of flood-prone properties with the ongoing expansion of their bike and pedestrian greenways system.

*Stormwater Management Plan*: A stormwater management plan is designed to address flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

- Survey results indicate that while some jurisdictions have prepared a stormwater management plan, most do not have a plan in place. However, significant technical and financial assistance is provided to municipal governments to support stormwater management planning, design, construction and maintenance through Mecklenburg County Storm Water Services staff.

**Administrative and Technical Capability**

The ability of a local government to develop and implement mitigation projects, policies and programs is directly tied to its ability to direct staff time and resources for that purpose. Administrative capability is evaluated by determining how mitigation-related activities are assigned to local departments and if there are adequate personnel resources to complete these activities. The degree of intergovernmental coordination among departments will also affect administrative capability associated with the implementation and success of proposed mitigation activities. Technical capability is evaluated by assessing the level of knowledge and technical expertise of local government employees, such as

personnel skilled in using geographic information systems (GIS) to analyze and assess community hazard vulnerability.

The *Capability Assessment Survey* was used to capture information on administrative and technical capability through the identification of available staff and personnel resources. **Table 7.7** provides a summary of the results for each jurisdiction in Mecklenburg County. A checkmark (✓) indicates that local staff members are tasked with the services listed. Additional information on administrative and technical capability is provided in the completed surveys.

**Table 7.7: Relevant Staff / Personnel Resources**

| JURISDICTION | Planners with knowledge of land development and land management practices | Engineers or professionals trained in construction practices related to buildings and/or infrastructure | Planners or engineers with an understanding of natural and/or human-caused hazards | Emergency manager | Floodplain manager | Land surveyors | Scientist familiar with the hazards of the community | Staff with education or expertise to assess the community's vulnerability to hazards | Personnel skilled in Geographic Information Systems (GIS) and/or HAZUS | Resource development staff or grant writers |
|---|---|---|---|---|---|---|---|---|---|---|
| Mecklenburg County | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| Charlotte | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Cornelius | ✓ | ✓ | | ✓ | ✓ | | | | ✓ | ✓ |
| Davidson | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ |
| Huntersville | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| Matthews | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ |
| Mint Hill | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ |
| Pineville | ✓ | ✓ | | ✓ | ✓ | | | | ✓ | |

## Fiscal Capability

The ability of a local government to take action is often closely associated with the amount of money available to implement policies and projects.[8] This may take the form of grant funding or locally-based revenue and financing. The costs associated with mitigation policy and project implementation vary widely. In some cases, policies are tied to staff time or administrative costs associated with the creation and monitoring of a given program. In other cases, direct expenses are linked to an actual project such as the acquisition of flood-prone homes, which can require a substantial commitment from local, state and federal funding sources.

[8] Gaining access to federal, state or other sources of funding is often an overriding factor driving the development and implementation of hazard mitigation plans. However, an important objective of local governments seeking a more sustainable future is the concept of self-reliance. Over time, local jurisdictions should seek the means to become less dependent on federal assistance, developing a more diversified approach that assesses the availability of federal, state and locally generated funding to implement mitigation actions. The countywide adoption of a stormwater utility fee is indicative of this approach. Additional assistance may be available from the business and corporate sector as well as certain non-profit organizations. A broad-based mitigation strategy should also include an attempt to identify mitigation measures that cost little or no money, yet may compliment the larger array of actions identified in the Plan.

The *Capability Assessment Survey* was used to capture information on each jurisdiction's fiscal capability through the identification of locally available financial resources. **Table 7.8** provides a summary of the results for each jurisdiction in Mecklenburg County. A checkmark (✓) indicates that the listed fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds). Additional information on fiscal capability is provided in the completed surveys, which can be obtained through Mecklenburg County.

**Table: 7.8: Relevant Fiscal Resources**

| JURISDICTION | Capital Improvement Programming | Community Development Block Grants | Special Purpose Taxes | Gas / Electric Utility Fees | Water / Sewer Fees | Stormwater Utility Fees | Development Impact Fees | General Obligation Bonds | Revenue Bonds | Special Tax Bonds |
|---|---|---|---|---|---|---|---|---|---|---|
| Mecklenburg County | ✓ | | | | ✓ | ✓ | | | | |
| Charlotte | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Cornelius | ✓ | ✓ | ✓ | | | ✓ | | ✓ | ✓ | ✓ |
| Davidson | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Huntersville | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | |
| Matthews | ✓ | ✓ | | | | ✓ | | ✓ | | |
| Mint Hill | | ✓ | | ✓ | | ✓ | | ✓ | | |
| Pineville | | ✓ | | ✓ | | ✓ | | ✓ | | |

### Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to reduce the impact of future hazard events. The adoption of hazard mitigation measures may be seen as an impediment to growth and economic development. Or mitigation in general may not generate the same level of interest among local officials when compared with competing priorities. Therefore the local political climate must be considered when designing mitigation strategies, as it could be the most difficult hurdle to overcome in accomplishing the adoption or implementation of specific actions. For example, the mapping of the county's floodplains in a manner that take into account future development and the resulting increase in flood elevations required a high degree of political support. This was accomplished through the extensive, long-term involvement of developers, county officials and concerned landowners. The adoption of a countywide stormwater utility fee represents another example of a policy measure that requires a significant level of commitment from elected officials and public support of hazard mitigation principles.

The *Capability Assessment Survey* was used to capture information on each jurisdiction's political capability. Survey respondents were asked to identify examples of political capability, such as guiding development away from identified hazard areas, restricting public investments or capital improvements within hazard areas, or enforcing local development standards that go beyond minimum state or federal requirements (i.e., building codes, floodplain management, etc.). **Table 7.9** provides a summary of the individual responses for each jurisdiction.

**Table 7.9: Political Capability**

| JURISDICTION | COMMENTS |
|---|---|
| Mecklenburg County | 1. Water supply watershed protection standards exceed State minimums. 2. Recent floodplain regulations reduced amount of filling in floodplain fringe; remapping of floodplains includes future land use for regulatory purposes. 3. Stream Buffer Requirements. 4. Greenway Master plan/open space programs. 5. Adopted Watershed Flood Mitigation Plans. 6. Local matching funds continually approved for HMGP and FMA grants for flood prone property acquisition. |
| Charlotte | Watershed Protection standards exceed State minimums; Post Construction Controls Ordinance exceed State minimums; Storm Water Utility Fee; Floodplain regulations reduced amount of filling in the floodplain fringe; Floodplain maps include future land use conditions and are used for regulatory purposes. Adopted future land use maps show most floodplain areas as open/green space. |
| Cornelius | No comments provided. |
| Davidson | Davidson adopted a more stringent version of the floodplain and SWIM buffer ordinance. Planning Ordinance requires 50% open space in rural undeveloped areas. |
| Huntersville | 1. Low Impact Design (LID) Development (Mecklenburg County manual). 2. Steer development away from steep slopes, SWIM buffers mad lake buffers through zoning ordinance and subdivision regulations. 3. New strict floodplain regulations passed in March 2, 2009 (Code of Ordinances & zoning ordinance). 4. Stormwater management fee & guidelines. 5. Watershed areas limiting impervious surface. |
| Matthews | The Town has been active in supporting policies that discourage development in areas such as floodplains, and has implemented floodplain restrictions more stringent than required. The Town also supports SWIM buffers and dedication to the public of land in floodplains as part of zoning approvals. |
| Mint Hill | No comments provided. |
| Pineville | The Town actively participates in the NFIP Community Rating System as a Class 6 community despite having limited administrative and technical capability through continued coordination with Mecklenburg County Storm Water Services. |

### County and Municipal Self Assessment

In addition to the inventory and analysis of specific local capabilities, the *Capability Assessment Survey* required each local jurisdiction to conduct its own self assessment of its capability to implement hazard mitigation activities. As part of this process, county and municipal officials were encouraged to consider the barriers to implementing proposed mitigation strategies in addition to the mechanisms that could enhance or further such strategies. They were also encouraged to consider their jurisdiction's ability to expand and improve their existing local tools and capabilities for natural hazard reduction. In response to the survey questionnaire, local officials classified each of the capabilities as either "limited," "moderate" or "high."

**Table 7.10** summarizes the results of the self assessment process for each jurisdiction in Mecklenburg County. An "**L**" indicates limited capability; an "**M**" indicates moderate capability; and an "**H**" indicates high capability.

**Table 7.10: Self Assessment of Local Capability**

| JURISDICTION | Planning and Regulatory Capability | Administrative and Technical Capability | Fiscal Capability | Political Capability | Overall Capability |
|---|---|---|---|---|---|
| Mecklenburg County | H | H | H | H | H |
| Charlotte | H | H | H | H | H |
| Cornelius | M | H | H | M | M |
| Davidson | H | M | M | H | M |
| Huntersville | H | H | H | H | H |
| Matthews | H | H | M | H | H |
| Mint Hill | L | M | L | L | L |
| Pineville | M | M | H | H | H |

## PREVIOUSLY IMPLEMENTED MITIGATION MEASURES

The success of future mitigation efforts in a community can be gauged to some extent by its past efforts. Previously implemented mitigation measures indicate that there is, or has been, a desire to reduce the effects of natural hazards, and the success of these projects can be influential in building local government support for new mitigation efforts. Mecklenburg County has a well documented history of implementing hazard mitigation measures, most notably in an attempt to reduce the effects of flooding. A summary of those actions proposed by each jurisdiction to address flood and other natural hazards in the initial 2005 version of this Plan are listed in Section 9: *Mitigation Action Plans*, along with a brief status update on each action. However, a more detailed summary of the major flood mitigation measures undertaken by Mecklenburg County in cooperation with its municipal jurisdictions is provided below.

Throughout its history, Mecklenburg County has been subject to flood risk in various locations throughout the county. The rapid growth experienced in particular by Mecklenburg County and the City of Charlotte from the 1970s to the present has accelerated the rate at which these problems have grown. The County and the City have taken a variety of measures to offset and minimize identified problems.

### 1970s

During the 1970s, the U.S. Army Corps of Engineers undertook drainage improvements to several streams and watersheds within the City of Charlotte. Projects included the straightening, widening and deepening of several streams including Little Sugar Creek and Briar Creek in the areas around uptown Charlotte.

In 1976, the Mecklenburg County and the City of Charlotte joined the National Flood Insurance Program. Flood Insurance Rate Maps were created to identify flood-prone areas within the county and to help guide future development. The original studies were prepared by the USACE in the early 1970s.

In 1978 and 1979, the UNC-Charlotte Institute for Urban Studies and Community Service prepared two reports titled, *Measurement of Potential Flood Damages to Flood-Prone Structures within the City of*

*Charlotte* and *Measurement of Potential Flood Damages in Mecklenburg County* that provided a comprehensive analysis of the flood risk within the city and county at the time.

**1980s**

In 1983, the U.S. Army Corps of Engineers produced a report titled, *Sugar Creek Basin, Study to Determine the Feasibility of Providing Flood Control and Related Water Resources Improvements* that detailed alternatives to reduce flooding within the entire Sugar Creek watershed. Suggested mitigation alternatives included the acquisition of flood-prone structures, and the creation of levees and channel modifications. The report was met with a great deal of resistance from property owners and was never pursued.

**1990s**

The 1990s saw significant progress within the Mecklenburg County and the City of Charlotte to coordinate flood loss reduction strategies, including the implementation of comprehensive plans and specific mitigation measures. An important part of this strategy included the formation of the Charlotte-Mecklenburg Storm Water Services, which provided the organizational structure needed to oversee many of the identified flood-mitigation objectives. Additional actions included the creation of stormwater utilities for both the city and county, which focused on maintaining and improving drainage infrastructure. The creation of a monthly stormwater fee provided a stable funding source to tackle problems that had been exacerbated by decades of growth. Flood events in August 1995 and July 1997 added an increased level of visibility and interest in addressing flood risk across the county.

***Mecklenburg County Floodplain Management Guidance Document***

In 1995, two floodplain management workshops were held that resulted in the development of the *Mecklenburg County Floodplain Management Guidance Document* (Guidance Document). This document, adopted in December 1997, provided an overarching framework to guide future floodplain management and flood mitigation measures that are still in practice today.

The Guidance Document assessed potential flood mitigation measures across three interrelated perspectives:

- reduce flood risk to existing structures;
- reduce or prevent flood risk for new development; and
- develop new policies that are supportive of other public initiatives (water quality, greenway development, etc.).

Based on the three strategies, the county evaluated a number of floodplain management policies and recommendations. The implementation of several recommendations has had a significant impact on the overall reduction of flood risk within the county. In particular, the initiation of an updated Flood Insurance Rate Map for the city and county spurred renewed interest in evaluating regulatory requirements in the floodplain. A pilot report titled *Mallard Creek Floodplain Analysis and Floodplain Fill Assessment*, prepared in December 1998, evaluated and quantified several key issues, including:

- How much have flood elevations changed since the existing FIRMs were developed?
- What is the impact of allowing fill in the flood fringe?
- What is the impact of future development on flood elevations?

The results of the study served as a catalyst to advance flood hazard mitigation efforts within the county. The answers to these questions, although intuitive to some at the time, were now backed up with solid technical data that was used to support future initiatives. The report showed that within the Mallard Creek watershed, flood elevations on all but the smallest streams increased one foot or more from the previous FIRM. Based on the results of this study, the city and county were able to gain political support necessary to obtain local funding to perform a complete restudy of all watersheds within the county and to develop updated flood elevations for all streams.

Several techniques were used to model the impact of floodplain fill. The findings showed that the impact of floodplain fill ranged from two to seven feet along streams in the watershed. As a result, the city and county moved forward with the following initiatives:

- implementing increased elevation requirements from "one foot above BFE" to "one foot above future conditions BFE;"
- establishing a local floodway based on more restrictive requirements, including a local encroachment standard based on a 0.5 foot increase in elevation instead of the FEMA standard one foot; and
- establishing buffer requirements based on water quality requirements that would further reduce impacts on flooding (this information further supported the findings of the April 9, 1998 *Surface Water Improvement and Management [SWIM] Panel & Staff Consensus Report*).

Based on future conditions land use plans, it was shown that the expected future development within the watershed could increase flood elevations one to four feet in some instances. While the impact in the more urban watershed would be less in many cases, the overall impact was significant. From these findings the county was able to gain support for:

- developing future conditions flood elevations for watersheds in the county as part of the flood map update effort; and
- implementing and adopting new regulations that required all new construction to be built one foot above the future conditions base flood elevation.

After the completion of the updated flood maps for Mecklenburg County, information was available to perform detailed evaluations of mitigation alternatives based on the projected impact of future flood events on existing structures in and immediately adjacent to the floodplain. Specific mitigation measures identified included moving development away from the flood fringe, implementing floodproofing and elevation techniques for businesses and homeowners that remained in the floodplain, and reducing the amount of floodplain fill allowed through new encroachment standards and buffer requirements. Finally, the data allowed the county to more effectively manage new development based on the results of the future conditions mapping effort.

The 1995 and 1997 flood events resulted in significant flood damage to several residential neighborhoods. It was determined that the acquisition or elevation of these properties was among the only available alternatives. Structural measures such as stream channelization ran counter to the county's environmental objectives. In order to obtain potential funding to assist with mitigation efforts, Mecklenburg County developed a summary report evaluating over 1,000 flood-prone properties. Specific factors reviewed included past NFIP claims, repetitive losses and the evaluation of benefit-cost ratios of differing mitigation measures based on FEMA's Benefit-Cost Module. This evaluation narrowed the focus down to eight specific problem areas that had the highest benefit-cost ratio. Grant applications totaling over $12 million were submitted to the State of North Carolina in order to purchase 116 residential structures.

Since that time, the county has leveraged additional local funds through coordinated inter-departmental efforts to acquire additional properties to support their mitigation efforts as well as the efforts to expand the county greenway system. The county mitigation effort continues to identify funding opportunities to maximize the opportunity to further reduce flood damages to existing homes.

***SWIM Panel & Staff Consensus Report***

In April 1998, the Mecklenburg County Board of County Commissioners adopted the *Surface Water Improvement and Management (SWIM) Implementation Strategy*. This strategy was developed through a coordinated effort of the SWIM Panel, which was comprised of stakeholders from numerous local and state agencies as well as numerous other special interest groups. A variety of measures was identified and has been implemented to help improve overall water quality in Mecklenburg County. These measures include:

- enforce Erosion Control and Sedimentation Control Ordinances;
- enforce current buffers in regulated water supply watersheds;
- establish and maintain vegetative stream buffers;
- address elevated levels of fecal coliform bacteria;
- implement countywide water quality modeling;
- enhance water quality monitoring;
- improve coordination between county agencies;
- conduct stream inventory and assessment; and
- increase public education and awareness.

Many of these initiatives have a direct impact on overall flood mitigation efforts including the establishment of stream buffer requirements for streams throughout the county. Buffer requirements were established for all streams draining an area greater then 100 acres. These requirements exceeded the typical mapped FEMA floodplains, which typically include streams draining an area greater than one square mile. As a result, the buffer regulations have a direct impact on reducing the amount of disturbance and fill that occurs within the regulated floodplains but also has a similar impact on new development in the upper reaches of the watersheds that weren't addressed in the county floodplain ordinance.

***Mecklenburg County Greenway Master Plan 1999-2009***

In 1999, the county adopted the *Mecklenburg County Greenway Master Plan 1999-2009* that provided a comprehensive update to previous greenway master planning efforts undertaken by the county. This update recommended that the Greenway System be expanded to include floodplain management and water quality buffer objectives. The overall trail system was expanded from the original network defined in the 1980 Master Plan. In addition, the plan included a detailed description of how a variety of existing goals including floodplain management, water quality, recreation and habitat conservation could be linked. As a result, the Greenway Master Plan has become an integral part of the ongoing efforts to acquire existing flood-prone properties.

**2000–Present**

As part of the implementation of the *Mecklenburg County Floodplain Management Guidance Document*, the county undertook the development of preliminary engineering studies for the ten most urbanized watersheds in Mecklenburg County:

- Briar Creek Watershed
- Four Mile Creek Watershed
- Irwin Creek Watershed
- Lower Little Sugar Creek Watershed
- Mallard Creek Watershed
- McAlpine Creek Watershed
- McDowell Creek Watershed
- McMullen Creek Watershed
- Sugar Creek Watershed
- Upper Little Sugar Creek Watershed

The studies were conducted on a watershed-wide basis between 2000 and 2003 and resulted in one report for each of the watersheds. The primary focus of the reports was to conduct a review of pertinent stream and watershed information, assess flood damages and investigate flood hazard mitigation alternatives within the FEMA regulated floodplains. The compilation of these studies identified several pieces of critical information:

***Flood-prone Structures***

A total of 2,646 buildings are located within the future conditions floodplains for the 55 study streams located in the 10 watersheds. Of that total, 1,006 of the structures have a finished floor that is below the future conditions flood elevation. Approximately 74 percent of the flood-prone structures are located in the central watersheds within the City of Charlotte (Briar, Irwin, McMullen and Upper Little Sugar Creek).

***Roadway Overtopping***

Estimated flood depths at road crossings were identified for all structures along the regulated floodplains within the county. It is estimated that there are approximately 250 road crossings that are subject to overtopping from the future conditions floodplain.

***Estimated Flood Damage***

Flood damages were estimated for the 1,006 structures that are located below the future conditions floodplain using the FEMA Benefit-Cost module. The total present value of flood damages for these 1,006 structures was estimated at approximately $513 million. It should be noted that almost $400 million of those projected damages are located in the Briar Creek Watershed.

***Flood Hazard Mitigation Improvement Alternatives***

The 1,006 structures that were subject to flood risk were divided into approximately 160 problem areas for the purpose of evaluating mitigation alternatives. Improvement alternatives included acquisition, elevation, construction of floodwalls and levees, infrastructure improvements, and a “no action” alternative. Based on the evaluation of the alternatives and a benefit-cost analysis, the reports recommended a total of approximately $113 million in potential mitigation alternatives. Implementing these alternatives would remove approximately 93 percent of the total $513 million in flood damages predicted in the studies.

Since the completion of these studies, Mecklenburg County has continued to strengthen its floodplain mapping and regulatory efforts, including through the adoption of higher regulatory standards across the county (including for other incorporated municipalities) as listed earlier in this section (see Tables 7.3 and 7.4). It has also been highly successful in its active flood mitigation efforts including the *Floodplain Buyout Program*, further described below.

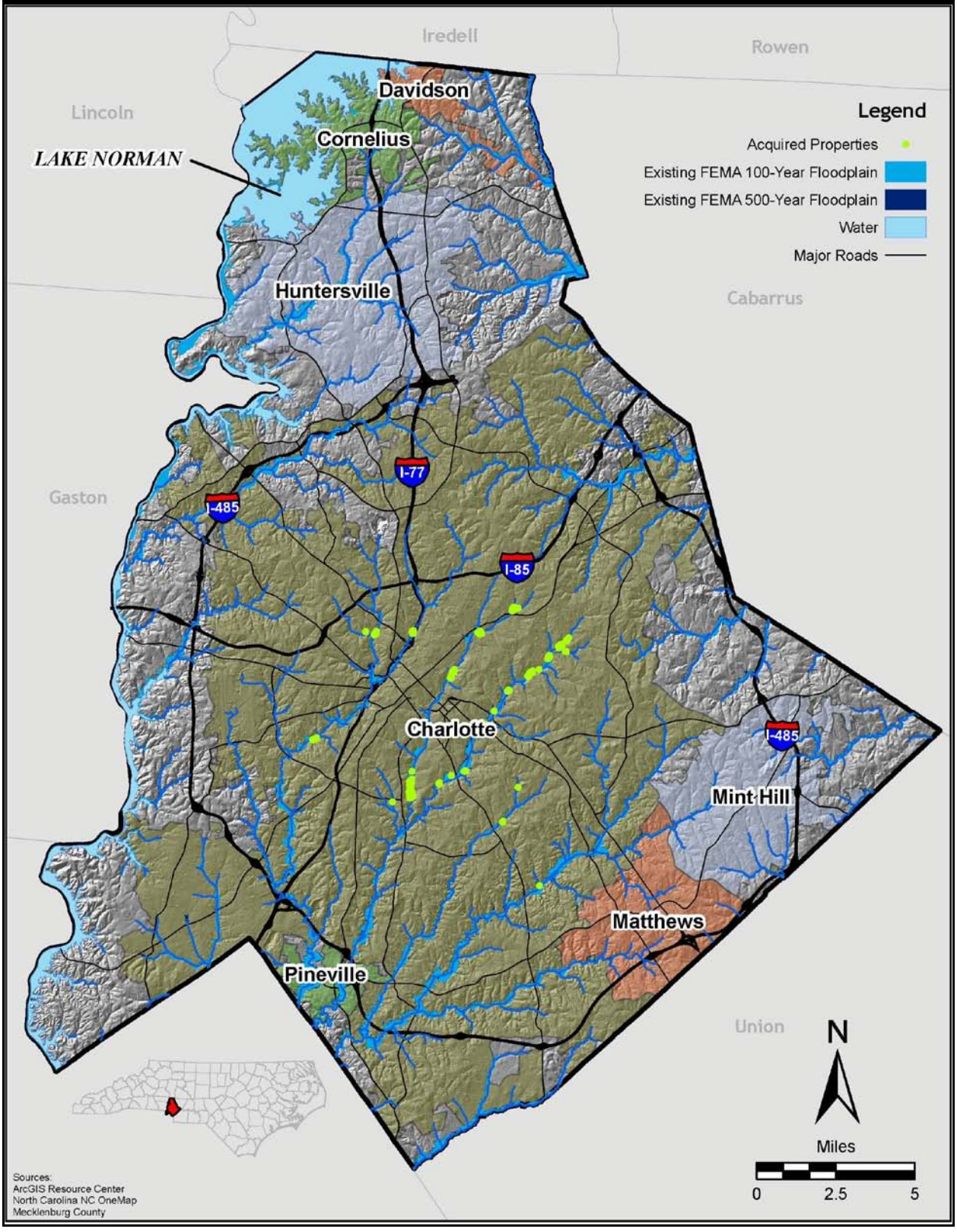
### ***Mecklenburg County Floodplain Buyout (Acquisition) Program***

The County's Floodplain Buyout Program is administered by Charlotte-Mecklenburg Storm Water Services (CMSWS). Through this highly successful program the County has to date purchased more than 200 flood-prone structures and relocated more than 400 families that were located in identified special flood hazard areas. These buildings were in more than a dozen neighborhoods along various creeks (see **Figure 7.2**. for general locations of properties acquired), and most were often subject repetitive flooding including those major events highlighted and described in Section 5: *Hazard Analysis*. Funding support for the buyouts comes from a combination of federal, state and local funds. Buildings purchased through the Buyout Program are demolished or relocated, and the floodplain is then restored to a natural state to store and filter excess rainfall and storm water runoff. In total, it is estimated that more than 80 acres of floodplain area has been reclaimed through the County's efforts to be maintained as open space in perpetuity.

As part of the program, the County has also been successful in the implementation of a "Quick Buy" program. The program, which relies solely on local funds (including County Storm Water reserve funds and Park and Recreation Bond funds), allows Storm Water Services to use locally-set criteria to determine which properties are eligible and then quickly buy the approved properties before flood damage is repaired. Quick Buys are processed in a matter of weeks or months. By comparison, it takes more than a year to acquire eligible floodplain properties when outside grants are used.

In the fall of 2008, following the flooding caused by the remnants of Tropical Storm Fay, the Mecklenburg County Board of County Commissioners approved spending up to $6 million through the Quick Buy program to purchase 41 homes or businesses that had been damaged by flooding by willing and voluntary homeowners. Qualifying properties had to meet specific criteria such as risk of flooding or proximity to future greenway or park land. In the end, more than 90% (37 homes) of those invited to participate in the Quick Buy program agreed to sell their homes to the County. All structures were in the portion of the floodplain at highest risk of flooding and built decades ago when there were no restrictions on floodplain construction. Most of these properties were along Briar Creek near Shamrock Drive, Eastway Drive and The Plaza. Property owners were offered fair market value of the house before the flood, minus the flood damages. Owners were not forced to sell, however, those who chose to repair their homes rather than sell had to comply with all regulations for floodplain development. In some cases, that required the owner to raise the elevation of their living space above higher base flood elevations. All properties purchased under the 2008 Quick Buy program will be left as open space and enhanced to improve water quality, and some of the land acquired may eventually be used for recreational purposes such as a greenway

**Figure 7.2: Properties Acquired by Mecklenburg County's Floodplain Buyout Program**



# CONCLUSIONS ON LOCAL CAPABILITY

In order to form meaningful conclusions on the assessment of local capability, a scoring system was designed and applied to the results of the *Capability Assessment Survey*. This approach, further described below, assesses the level of capability for each jurisdiction in Mecklenburg County. It is important to note that the score received by each participating jurisdiction is not intended to compare one to the other. Rather, the scoring system is intended to assist each jurisdiction develop mitigation actions that reflect their abilities and help to identify areas that can be improved through the adoption of specific mitigation actions addressing these weaknesses.

## Points System for Capability Ranking

**Scoring:**

**0-24 points = Limited overall capability**
**25-49 points = Moderate overall capability**
**50-82 points = High overall capability**

### I. Planning and Regulatory Capability (Up to 46 points)

**Yes=3 points Under Development or Under County Jurisdiction=1 No=0 points**

- Hazard Mitigation Plan
- Comprehensive Land Use Plan
- Floodplain Management Plan
- Participate in CRS Program
- BCEGS Grade of 1 to 5

**Yes=2 points Under Development or County Jurisdiction=1 No=0 points**

- Open Space Management / Parks & Rec. Plan
- Stormwater Management Plan
- Emergency Operations Plan
- SARA Title III
- Radiological Emergency Plan
- Continuity of Operations Plan
- Evacuation Plan
- Disaster Recovery Plan
- Flood Damage Prevention Ordinance
- BCEGS Grade of 6 to 9

**Yes=1 point No=0 points**

- Capital Improvements Plan
- Economic Development Plan
- Historic Preservation Plan
- Zoning Ordinance
- Subdivision Ordinance
- Unified Development Ordinance
- Building Code
- Fire Code
- Participate in NFIP Program

### II. Administrative and Technical Capability (Up to 15 points)

**Yes=2 points No=0 points**

- Planners with knowledge of land development and land management practices
- Engineers or professionals trained in construction practices related to buildings and/or infrastructure
- Planners or engineers with an understanding of natural and/or human-caused hazards
- Emergency manager
- Floodplain manager

**Yes=1 point No=0 points**

- Land surveyors
- Scientist familiar with the hazards of the community
- Staff with education or expertise to assess the community's vulnerability to hazards
- Personnel skilled in Geographic Information Systems (GIS) and/or HAZUS
- Resource development staff or grant writers

### III. Fiscal Capability (Up to 11 points)

**Yes=1 point No=0 points**

- Capital Improvement Programming
- Community Development Block Grants
- Special Purpose Taxes
- Gas / Electric Utility Fees
- Water / Sewer Fees
- Stormwater Utility Fees
- Development Impact Fees
- General Obligation Bonds
- Revenue Bonds
- Special Tax Bonds
- Other

### IV. Self-Assessment of Overall Capability (Up to 10 points)

**High=2 points Moderate=1 points Low=0 points (Self-ranked by jurisdiction)**

- Technical Capability
- Fiscal Capability
- Administrative Capability
- Political Capability
- Overall Capability

*Note: This methodology is based on best available information. If a jurisdiction does not provide information on any of the above items, a point value of zero (0) will be assigned for that item.*

**Table 7.11** shows the results of the capability assessment using the designed scoring methodology in 2005 and again during the 2010 plan update. According to the 2010 assessment, the local capability of all jurisdictions increased to some degree, and the current average local capability score for all local jurisdictions in Mecklenburg County is **57.13**. This is an increase of nearly five points from the countywide average score of **52.38** as determined through the 2005 capability assessment. The jurisdictions with the largest increase in points since the 2005 capability assessment are the City of Charlotte and Town of Mint Hill with increases of 9 points and 7 points, respectively. All jurisdictions remained at the same overall capability rating as determined in 2005 with the exception of the Town of Matthews which went from a "moderate" capability rating to a "high" capability rating.

**Table 7.11: Capability Assessment Results**

| JURISDICTION | CAPABILITY SCORE (2004) | CAPABILITY SCORE (2010) | CAPABILITY RATING (2010) |
|---|---|---|---|
| Mecklenburg County | 66 | 69 | High |
| Charlotte | 67 | 76 | High |
| Cornelius | 50 | 53 | High |
| Davidson | 51 | 53 | High |
| Huntersville | 59 | 60 | High |
| Matthews | 49 | 57 | High |
| Mint Hill | 33 | 40 | Moderate |
| Pineville | 44 | 49 | Moderate |

The overall capability of local governments in Mecklenburg County to implement mitigation actions is determined to be moderate to high. Mecklenburg County and most of the municipal received a high capability rating. The scoring methodology used to conduct this assessment is meant to provide a general understanding of local capability for each jurisdiction. The results are based on the information provided by local officials in response to the *Capability Assessment Survey*, an instrument designed to measure local capability based on those indicators determined to be most relevant for mitigation purposes and referenced in FEMA planning guidance.

According to the assessment, local capability does vary between the local jurisdictions. While some municipalities have significant "in-house" staff resources, like Charlotte and Huntersville, others depend on outside sources such as Mecklenburg County, the Charlotte-Mecklenburg Planning Commission or private contractors to perform certain local functions or services such as emergency management and code enforcement. Smaller local governments typically combine multiple job responsibilities, such as a planning director serving as the floodplain manager, or the town manager serving as the local emergency manager.

Perhaps one of the most significant findings of the assessment is the widespread existence of several planning initiatives, programs and tools already in place across Mecklenburg County that support local planning, growth management and hazard mitigation efforts. As a result, jurisdictions understand the importance of intergovernmental coordination and how it applies to multi-jurisdictional planning. Mecklenburg County's local governments coordinate on a number of issues and strategies related to future land use planning and standards for regulating development, in addition to the provision of infrastructure such as sewer and water or public services such as police and fire protection.

Mecklenburg County's local governments should continue to apply this same level of coordination to hazard mitigation practices, building on the work already being done in flood plain management and emergency management preparedness initiatives. This Plan served as the vehicle to begin this process and the intergovernmental coordination demonstrated in 2005 continues to this day, as exemplified through the 2010 plan update process. This coordination will continue throughout the implementation and regular maintenance process of this plan as described in Section 10: *Plan Maintenance Procedures*. One of the best ways to obtain local buy-in and long-term success is to identify and implement achievable mitigation actions (as listed in each jurisdictions' individual Mitigation Action Plans) that will facilitate continued intergovernmental coordination not only across the county, but with state and federal agencies as well.

# LINKING THE CAPABILITY ASSESSMENT WITH THE RISK ASSESSMENT AND THE MITIGATION STRATEGY

The conclusions of the risk assessment and capability assessment serve as the foundation for a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, each jurisdiction must consider not only their level of hazard risk but also their existing capability to minimize or eliminate that risk. **Figure 7.3** shows a Risk vs. Capability Matrix that is used to illustrate each jurisdiction's overall hazard risk[9] in comparison to their overall capability. This matrix has been completed for each of Mecklenburg County's participating jurisdictions and is included in each jurisdiction's separate and distinct *Mitigation Action Plan* (Section 9).

**Figure 7.3: Risk vs. Capability Matrix**

| | | HAZARD RISK | | |
|---|---|---|---|---|
| | | Limited | Moderate | High |
| OVERALL CAPABILITY | High | | | |
| | Moderate | | | |
| | Limited | | | |

In jurisdictions where the overall hazard risk is considered to be HIGH, and local capability is considered LIMITED, then specific mitigation actions that account for these conditions should be considered. This may include less costly actions such as minor ordinance revisions or public awareness activities. Further, if necessary, specific capabilities may need to be improved in order to better address recurring threats. Similarly, in cases where the hazard vulnerability is LIMITED and overall capability is HIGH, more emphasis can be placed on actions that may impact future vulnerability such as guiding development away from known hazard areas.

[9] Overall hazard risk was determined for each jurisdiction using the results of the risk assessment (estimated losses for all natural hazards) combined with specific information on the following factors: total population, population growth rate, land area, historical disaster declarations, unique hazard risks, NFIP participation and the value of existing pre-FIRM structures. More information on the methodology used to determine overall hazard risk is available through Mecklenburg County upon request.